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NOTES ON THE KADO, OR SUN DANCE OF THE KIOWA

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I. INTRODUCTION

THE Plains of the West were inhabited at the time of their discovery by a number of wandering tribes that depended upon the buffalo for subsistence. They spoke different languages, yet possessed together a culture that was distinctive of the Plains.

One of the most conspicuous elements of that culture, after the sign language, was the Medicine or Sun dance.

It is not known in what tribe this dance originated. It must, however, have started in the north, for all the tribes now on the southern Plains that practise the ceremony are, like the Kiowa, intruders, and brought it with them from the north.

The Kiowa received their Sun dance from an old Arapaho, to whom it was given by the Crows. It may have been that some of its features originated with the Crows, and were afterward amalgamated with others from a different source, after the Kiowa left the northern Plains.

The Kiowa, for instance, do not allow any cutting of flesh or shedding of blood in their Sun dance, whereas the Crows, from whom the Kiowa received the ceremony, cut themselves like the Dakota and Blackfeet, as well as the Southern Cheyenne and Arapaho, who migrated south after the Kiowa had moved down, packing their property on dogs.

The Pawnee have been considered somewhat original in their culture. Some of the customs of other tribes have been traced to them; they were long in the district where found at the discovery, and appear to have reached it from the Southwest, according to their traditions, while their bloody sacrifice of captives to the Morning Star had a Mexican cast. They were enemies of the Kiowa as far back as the latter can remember, down to March, 1873, when peace was made between them on the Washita.[1] The Comanche preceded the Kiowa, moving southward from the headwaters of the Platte and the Arkansas, moving their property with dogs. They left behind them their relatives the Shoshoni. The Comanche have no Sun dance, nor do their western relatives the Lemhi, according to Lowie, whereas the Shoshoni not only have a Sun dance but cut themselves like the other northern Plains tribes. It is therefore probable that the Comanche left the Shoshoni before the acquisition of the Sun dance. The former do not appear in Spanish writings as being in the south before the year 1700.

It is the view of the writer, then, that the Sun dance originated on the northern Plains—we can follow it certainly from the Kiowa to the Crows in one instance, and the Crows may have been the tribe which originated it, Pawnee influence possibly being responsible for the torture features, although we have nothing definite pointing to the Pawnee,[2] other than the fact of their ceremonies, for the Morning Star.

The Kiowa and Kiowa Apache both say that they have been together ever since they grew up as a people, migrated together from the north, and have the same Sun dance. The Kiowa Apache have a regular, appointed place in the Kiowa ceremonial circle.

Those of us who study the Indian in his home, possibly from the viewpoint of a single tribe, are apt to take a narrow view of the customs and ceremonies observed, but it is a fact that a tribe can not

[1] Battey, *Life and Adventures*, p. 130.

[2] The counterpart of the torture features in the old world is found in India and is called "hook swinging." "A place on the shoulders is beaten by the priest until benumbed. After that the hook is fixed into the flesh thus prepared, and in this way the unhappy wretch is raised in the air. While suspended thus he is careful not to show any sign of pain, and it is done in fulfillment of a vow for recovery from sickness." —Dubois, *Hindu Manners, Customs and Ceremonies*, p. 605.

really be known from what is learned from that tribe alone. It has been well said in an analogous case that "he who knows but one language knows none." We must therefore study each tribe not only by itself but also in the light thrown upon it by our knowledge of other primitive peoples and of the literature bearing upon the whole subject, then we will find that many of the habits and customs of primitive man have their counterparts among tribes of like degree of culture and similar environment, not only in their own neighborhood, but in every part of the world; so that what would otherwise appear to be an isolated case is, in many instances, proven to be one of a world-wide series, and this will be found to be true of the Sun dance.

The Kiowa considered the Kado to be their most important ceremony, the whole tribe participating therein. It was a religious drama, the ceremonial worship of the Sun in his vernal splendor, as the creator and regenerator of the world.

They believed that it warded off sickness, caused happiness, prosperity, many children, success in war, and plenty of buffalo for all the people. It was frequently vowed by persons in danger from sickness or the enemy, but was determined upon by the *Taimay* keeper, who announced the time and place.

The corresponding medicine-lodge of the Cheyenne is called[1] "The new life lodge" according to the interpretation of the priest. The name means not only the "lodge of the new life" but the "new life" itself, and the performance of the ceremony is supposed to recreate, reform, reanimate the earth, vegetation, animal life, etc. When the writer lived among the Dakota he used to hear them call their Sun dance "Wi wakan wacipi," literally "Sun medicine dance." In his *Siouan Cults*, J. O.Dorsey, a much more competent Dakota scholar, calls it "Wi waŋyaŋg waċipi," literally "Looking at the Sun they dance." Dorsey is more likely to be correct in this matter, though possibly both names may be correct in different localities. However that may be our names "Sun dance" and "Medicine dance" evidently take their origin from this source. The sign name for the dance is made by imitating the blowing of

[1] G. A. Dorsey, *Field Columbian Museum Publications*, 103, vol. IX, no. 2, p. 57.

the whistle each dancer carries, the looking upward at the sun, as well as the up and down dance movement of right hand and shoulders in tune to the music of the drum and whistle. This sign name is the same for all the Sun dances of all the tribes both north and south, although these have different names in the spoken tongues.

The principal element in the Kado is the *Taimay* which is an image brought originally to the Kiowa from the Crows by an old Arapaho, and all the keepers of the Taimay have since been of the blood of that old Arapaho.

The Taimay is in the likeness of a small person, or doll, without legs. Its head is a small round stone covered with deerskin painted to resemble a person. It wears a shell gorget and has an eagle feather on its head; its body is made of deerskin and has short eagle body feathers hanging down all over it.[1]

When used in the dance, the body is tied to a staff about six feet long, stuck in the ground, in front of a cedar screen, which is opposite the main door, in the rear of what corresponds to the altar place, though there is no altar. This cedar screen makes a retiring place for the participants in the dance.

When not in use the image is kept rolled in various wrappings in a parflêche with a moon painted on it. The first wrapping is a white polecat's skin that was captured from the Pawnee about forty-nine years ago; the second is the skin of an antelope; the third is of calico. This whole bundle is then put into the parflêche.

The polecat's skin was the pipe bag of a Pawnee who was killed the fall before the "Smallpox Sun dance" on the "Red Sleeve river" (Pawnee Fork of the Arkansas in Kansas), according to the calendar history of the Kiowa, obtained by the writer from the hereditary keeper, covering a period of more than sixty years. The "Smallpox Sun dance" was held in 1862 and the Pawnee was therefore killed in the fall of 1861. This calendar was the first of those discovered, and led to the discovery of the others mentioned by Mooney in his "Calendar History of the Kiowa."[2] The Scott calendar is now in the Museum of the University of California.

[1] See pl. XVIII, *b*; pl. XIX, *d*; pl. XX, *h*; pl. XXI, *a*; pl. XXII, *b*.

[2] *17th Ann. Report of the Bureau of American Ethnology*, p. 143.

Other dates in Kiowa history during the last sixty years may be checked from these various calendars with considerable accuracy.

The Taimay image is kept with the greatest reverence and is never exposed except at the time of the Kado. Mooney tried in vain, for a year, to get a model of it, but, although many Kiowa were familiar with its appearance, it was considered too sacred to be copied, and he left the west without it. Fortunately I was able to procure one, which was sent after him, and it is of this he speaks in the memoir above cited.[1]

The Kiowa say that the word Taimay has for its only meaning "mosquito" and they have lost all idea of the connection of the mosquito with the image, or the dance, if any ever existed.

The dance was usually held in the spring. They say "We watch the white (sage) grass. When that is about a foot high, and the horses are all fat, that is the time," but circumstances might and frequently did delay it until after that time. In 1873 it began on June 16; the next year it did not begin until July 3.[2] It has been held in the middle of summer, and on several occasions there have been two in one summer. There were some years when circumstances prevented it altogether. It could not be held while the Taimay was in the possession of the Osage, from whom it was recovered in 1835, after peace was made with that tribe, a consequence of the Dragoon expedition of 1834 (the initial expedition of the 1st Dragoons described by Catlin in his work on *The North American Indians*). There was no dance held in 1870, the year the old Taimay keeper, An-so-teen, or Long-foot, died. The last Kado was held in 188–; the writer saw this Sun dance pole standing on Oak creek not far from the big bend of the Washita as late as 1892.

Formerly two small images were displayed with the Taimay—their staffs stuck into the ground in front of the cedar screen—but they were captured by the Ute in 1868 in a fight on the upper Canadian, near Adobe Walls, in the vicinity of what the Kiowa call "Red Bluffs" or "Red Promontory." The little images were kept with the Taimay, by the Taimay keeper, until Long-foot "took

[1] Page 242, plate XIX.

[2] Battey, op. cit., p. 166.

pity" on Comalty, the uncle of the present Comalty, and gave him one of the little ones to keep, but kept the other one with the Taimay. The small images were called "man" and "woman" respectively. Sometimes the "man" image went to war, but the "woman" never went

The other ceremonial articles belonging to the Kado were:

1. A fan made of the tail-feathers of the raven—lengthened out and stuck through a hoop into a handle (pl. XVIII, *d*; pl. XX, *g*).

2. A bison's skull, painted half red and half black; the eye sockets were stuffed with plugs made of long leaves of a plant that grows near the water—possibly flag leaves—by doubling the blades, then tying a string around the bunch, about six inches from the bight, thus making the bight into a round puff. The ear and nose cavities were treated in the same way, because "this pleased the buffalo." The black paint represented the black paint used by a successful war party; the red paint represented the attainment of old age. This skull and its symbols therefore were prayers for success in war; for the attainment of old age; for an abundance of buffalo for all the people. (Pl. XIX, *c*.)

3. A woman's root digger. This was sharpened and stuck into the ground; the stick was of ash and dressed like a man; the head was somewhat smaller than one's fist, and had a breath feather (*i. e.*, one of the fluffy, downy feathers that grow under the long tail-feathers of the war or golden eagle (*Aquila chrysaetas*), and flutter when breathed through); the breast has short eagle body feathers hanging down like the Taimay. This stick was an innovation made by Komaudy and has no medicine power; it is not known what he intended to represent by it. (Pl. XIX, *b*.)

4. Two small hollow mounds of clay used as "censers" in which live coals were kept and upon which dried cedar leaves were sprinkled, the smoke from which was used as incense, a "sweet savor." (Pl. XIX, *a*, *a*; pl. XX, *d*, *f*; pl. XXII. *c*.)

5. There were a number of ancient pipes kept with the Taimay, one especially spoken of as a "straight pipe" used in drawing the buffalo into the medicine lodge; it is believed that the straight pipe was the earliest of all varieties of pipes.

6. Two rawhide rattles (pl. XX, *c*).

The Taimay was regarded as the mediator between the people and the Sun power, as appears from some of the prayers made to it. They say: "The Father above made you for our life. We do not

TAIMAY KEEPER'S ASSISTANT DANCING BEFORE THE TAIMAY

a. One of the four Taimay keeper's assistants dancing. *b*. Taimay image. *c*. Offerings of cloth to the Taimay. The yellow streamers represent bolts of cloth unrolled, with upper ends tied, as offerings to the Sun-dance pole.

SUN-DANCE PROPERTIES ARRANGED IN THE MEDICINE LODGE

a. Earthen censer containing coals for burning cedar. *b*. Komandy's innovation: a woman's root-digger. *c*. Buffalo skull. *d*. Taimay. *e*. Ceremonial fan. *f*. Sun-dance pole. *g*. Stone in the doorway. *h*. Sand mound around foot of Sun-dance pole. ---- Tracks of dancers running in the door at *g*, around the center pole, and behind the left of the cedar screen (represented by the space back of *d*) and emerging at the right.

SUN-DANCE PRIEST (TAIMAY KEEPER) OFFICIATING BEFORE THE TAIMAY WITHIN THE LODGE

a. Assistant of the Taimay keeper. *b*. Komandy's innovation. *c*. Ceremonial rattles. *d*. Earthen censers. *e*. Buffalo skull. *f*. Earthen censer. *g*. Ceremonial fan. *h*. Taimay image tied to its staff. *i*. Taimay keeper.

know him. We can not see him where he is. Maybe you know him. Ask him to give you more power for our life," etc. The Taimay is supposed also to watch over the fortunes of the people. This is shown by the story of Komaudy who was lying, by himself, abandoned for dead in Mexico when he heard the Sun-dance whistle far off at night and the Taimay came to him and told him that "he was not going to die but would recover and get back to his people. And he got back."

The truth about this image, however, seems to be that it is used to give concreteness to their vague ideas of the Sun power, something that they can take hold of and endow with attributes—as an imaginative child does a doll—and dress up like the Samoyed stones described by Tylor.[1] "The Samoyed travelling ark sledge with its two deities, one with a stone head, the other a mere black stone, both dressed in green robes, with red lappets and both smeared with sacrificial blood, may serve as a type of stone worship." "The Virgin of the Caridad de Cobre" of eastern Cuba, the "Virgin of Antipolo" near Manila, and the "Santo Niño" of Cebu, are small figures about 18 inches long, dressed in jewels, gold, and velvet, that are held in great esteem by the devout and have come down from a respectable antiquity. The "Virgin of Antipolo" used to make many trips with the Spanish galleons between Manila and Acapulco in Mexico to protect them against the corsairs. It is carried in religious processions in Manila, escorted of late years by 15,000 persons.

When the Taimay keeper went into the medicine-lodge his face was painted, like that of the Taimay itself, with red and black zigzag lines downward from the eyes (pl. XVIII, *b*; pl. XX, *h*). He wore a skirt made of deerskin painted yellow, and his body was painted the same color. Why this color was used was not known,—it was to them just a part of the ceremony, handed down by their forefathers, and probably originated in a dream; there are many such subjects they are unable to explain, and still others of whose meaning they have a dim consciousness but are unable to elaborate and of which the meaning can sometimes be made out through their prayers. The

[1] E. B. Tylor, *Primitive Culture*, vol. II, p. 163.

Taimay keeper had sage tied around his wrists during the dance; he held a bunch of live cedar in his hand, and in his mouth an eagle-bone whistle with an eagle feather attached. A blue or green (many Indians do not distinguish between these two colors) sun was painted in the middle of his chest and back, and he wore on his head a cap, made of the skin of a jackrabbit with breath-feather attached. (Pl. XX, *h*; pl. XXII, *g*.)

The Taimay keeper had four assistants, chosen for four years each, to whom he taught the songs and ritual, so that in case of accident there would always be some one who could direct the ceremonies. These four men had deerskin skirts painted white, and a wreath of sage, with eagle feather, on the head. Sage was tied around both wrists and ankles and a bunch of live cedar was carried in the hand. These men did the ceremonial painting, and assisted the Taimay keeper. (Pl. XVIII, *a*; pl. XXII, *f*.)

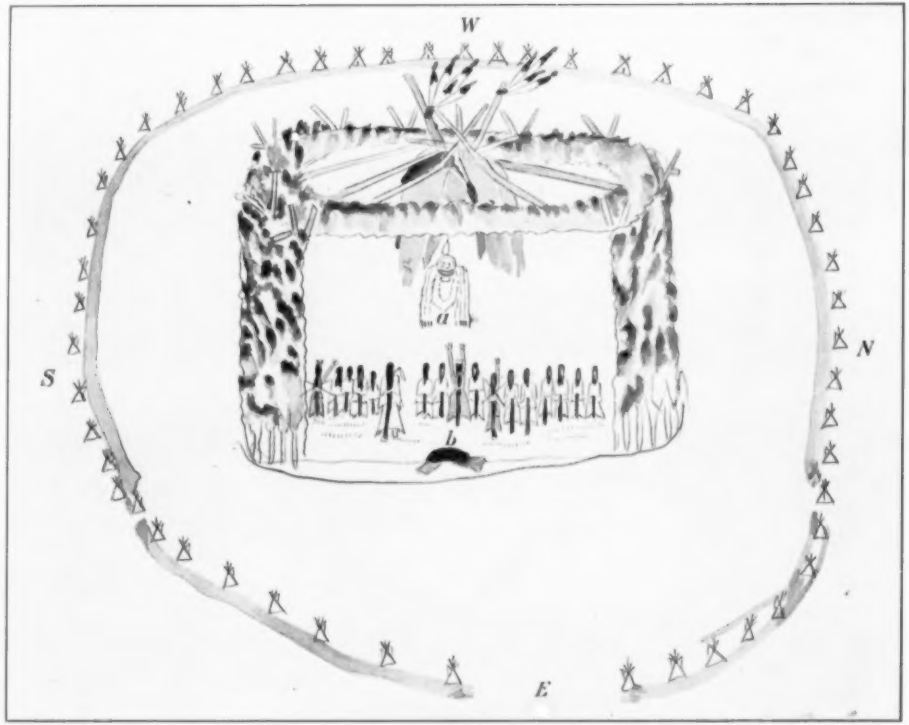
A scalp taken from the Taimay shields, with two long eagle tail-feathers attached, was fastened to the breast and another on the back, and a green sun and two crescent moons were painted on the breast and back. Sometimes formerly these suns and moons were cut into the skin, not at the Sun dance but at some other time. (Pl. XVIII, *a*; pl. XXII, *f*.)

The dancers had no caps or wreaths, but each wore a deerskin skirt painted white, and their faces and bodies were painted the same color. (Pl. XXI.)

The Taimay keeper, his four assistants, and all the dancers had eagle-bone whistles with eagle-feathers attached, and all persons connected with the dance wore their breech-clouts outside of their skirts. (Pl. XVIII, *a*; pl. XX, *f*; pl. XXII.)

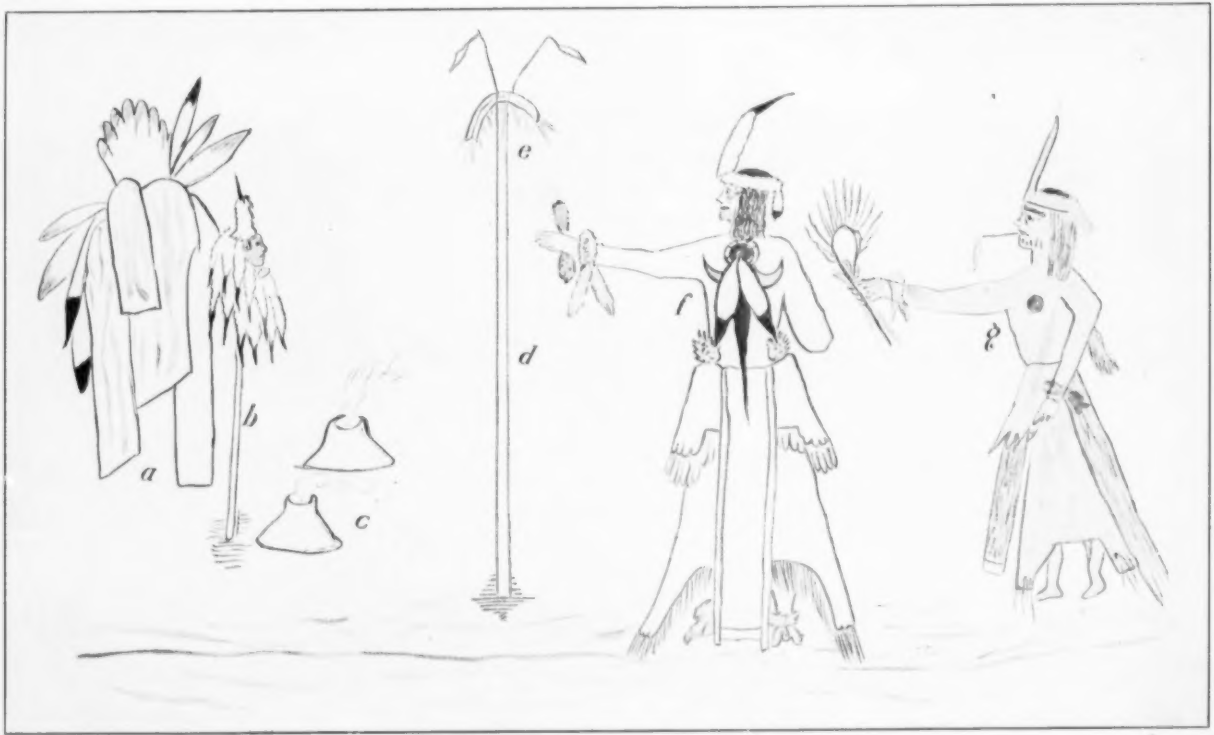
The Taimay keeper entered the medicine-lodge in procession with the others and did not eat or drink or go out of the lodge for four days and nights.

During the time of cutting the poles and branches for the construction of the lodge, the people were scattered through the woods laughing and singing, and in old times there was more or less promiscuous intercourse between the sexes, married and single, but to this no stigma was attached. While not exactly open,



THE DANCERS WITHIN THE MEDICINE LODGE PRAYING TO THE TAIMAY

a. The Taimay. *b*. The flat stone in the doorway of the lodge. The outer circle represents the ceremonial circle of lodges.



THE TAIMAY KEEPER AND ASSISTANT PRAYING TO THE TAIMAY

a. Offerings to the Taimay. *b*. The staff to which the Taimay is attached. *c*. The earthen censers containing coals on which incense is burned. *d*. Sun-dance center pole. *e*. Medicine buffalo-bull hide on center pole. *f*. Taimay keeper's assistant. *g*. Taimay keeper.

this was considered the usual thing at this time and any man that wanted any woman could ask her. Compare the account of Herodotus of the temple of Mylitta in Babylon, and Hartland's account of European spring festivals.[1] The Russians have their festivals in the spring—a general feature of those festivals was the prevalence of promiscuous intercourse between the sexes. Similar festivals were held at one time all over Europe. Consult also the work of the Abbé Dubois,[2] giving an account of the ceremonies in connection with the car of Juggernaut where "men and women were mixed indiscriminately and liberties taken without entailing any consequences, delicacy and modesty are at a discount during these car festivals." Compare Tanner's *Narrative*, p. 135, as to license among the Chippewa at certain times.

The Kado season was a time of great jollity and rejoicing for the people, and of the reunion of families. The whole tribe was present, with visitors from many other tribes, and all sorts of feasts, soldier dances, and other entertainments were going on among the lodges whenever the people were not actively engaged with the Sun dance proper. By this means the young people of the various villages that lived apart from each other a large portion of the year, were brought together and became acquainted, the nation was solidified, and the effect of holding the dance upon the manner in which the Sun Father would regard them for the next year was considered most important.

While there was a general resemblance between the medicine-lodges of the various tribes (the Crows used raw buffalo hides instead of branches to make the shade, and some of the village Indians on the Missouri had ceremonial earth lodges), and the dancing and whistling with the eagle-bone whistle are similar rites, there were many differences to be noted among the details of the Sun-dance ceremonies of different tribes. The Kiowa, for instance, say nothing about the large collection of buffalo tongues used by the Crows and Blackfeet, but the most conspicuous difference is seen in the Kiowa reluctance to shed blood: there was no

[1] E. S. Hartland, *Primitive Paternity*, vol. II, p. 191.

[2] *Hindu Manners, Customs and Ceremonies*, p. 611.

cutting or skewering, no dragging of buffalo skulls as noted in the north. Even the medicine bull must be shot through the heart without wounding the lungs, so that he would not belch any blood, for otherwise misfortune would happen to the people. And no finger joints or bits of human flesh were sacrificed, in which respect it differed from the Dakota Sun dance witnessed by the writer in 1879, where the female relations of the dancers would cut off a finger joint, or a bit of flesh out of the arm, and hold it up as a sacrifice to the sun while making a prayer, and then cast it down at the foot of the Sun-dance pole. The Cheyenne and Arapaho, as well as the Caddo, Wichita, and Comanche, although the last had no medicine-dance of their own, were accustomed to visit the Kiowa dance in large numbers for the sake of the general jollity going on, much as any people gather in crowds at a country fair. In every religious ceremony of the Plains Indians white sage (*artemisia*) was used in various ways on the ground or worn on the body, and green cedar carried in the hand, while dried cedar leaves were used, whenever it was possible to obtain them, to make an incense, though it was believed that any evergreen would do.[1]

The writer has never seen any reason given for this, and the hundreds of Indians who have been asked for a reason always replied that the custom came down from their forefathers, without a reason, or else it was directed by their culture hero before they grew up as a people. There is, however, a fundamental reason other than the odor, which was not understood until it was unconsciously explained in a Kiowa prayer to the Sun: "Father! You give us this tree, cedar, because you love it. Every other tree dies, and grass; but this tree, it does not die in winter, its leaves do not drop off in the fall. We think you love it. You take care of it. You keep it always green. You give it a good road. I want you to smell its smoke." The same reason applies to the sage, which keeps green all winter, and the sacredness of these two comes fundamentally from their difference from other vegetation—from the fact that the Father has signified his especial love for them

[1] In fact the writer has been asked to get some of the evergreen leaves of various kinds growing in the Smithsonian grounds in Washington.

by taking care of them and keeping them alive during the winter, when others, to which he is presumably indifferent, are dead. The smoke of the cedar and the sweet vanilla grass are used as an incense, not with the idea primarily of purification, but because the odor is pleasing to "the Father." This custom of offering incense must be very old and probably came to the Christian Church out of a past of great duration.

The above Indian information, as well as the following Kiowa accounts, were obtained by me during nine years spent among the wilder tribes of the present Oklahoma. They were given in the sign language of the Plains and were received directly, without the intervention of an interpreter, or the use of any spoken tongue: it is probable that the following is the first published account of an Indian ceremony described by Indians by means of the sign language alone, and may prove interesting to those who do not know of what the sign language is capable. The illustrations were drawn by Hawgone, a Kiowa.

During this description of the Kado there were present Taybodal, Poor Buffalo, Frizzlehead, Heidsick, and Stumbling Bear, the oldest and most respected men of the tribe. They had all taken part in the Kado from their youth, and had seen many dances. I-see-oh (old name Tah-bone-moh), who had had daily intercourse in the sign language with the writer for nine years, was their "spokesman."

II. The Kado

"In old times the Kiowa villages used to be divided in winter and camped in different parts of the country, where they would get plenty of game, good grass for the horses, plenty of wood and shelter from the cold, as well as safety from their enemies. In the middle of winter, the man who kept the Taimay would consider about having a medicine dance the next spring—if they make a Sun dance it will drive off sickness from the people. He would be living somewhere with a few lodges only, and would call in the people and tell them what he had determined upon, direct them to send messengers to the other villages, and tell them that in the spring he would make a Sun dance at a certain place when the

grass would be a foot high; that they must stop all foolish or crazy work, like going to war, and everybody must come where the medicine or Taimay keeper appoints,—nobody can stay away. Then they all move in to the place appointed by the Taimay keeper. He then asks if everybody has arrived, and they say, 'Yes, all the lodges are here.' Then he says: 'We will make a medicine lodge. Bring me a gentle horse before sunrise.' Next morning he gets on the horse and the first thing he says is: 'You must stop all quarreling and all foolish conduct. I forbid it!' He has the Taimay in a sack tied on his back by a string around his neck. Some chief then harangues the villages: 'Do not go out to look for your horses. Stay in your lodges; the Taimay keeper says so!' Then the Taimay keeper rides around on the prairie at a distance from the village; everybody looks at him and watches him; he goes all the way round the village to the place he started from—then he goes to his own lodge and dismounts. All Kiowas know him—he forbids all quarreling and crazy work. If any man thinks of doing that he is afraid of the Taimay keeper. Two young men are sent to look for a tree, just like scouts looking for the enemy, for the center pole, near where there is plenty of small green timber and a wide stream. They look for it carefully, not in a hurry; they do it wisely, and all move over near it and camp. If they do not find the tree they come back and the chief harangues the village: 'Have patience. We will soon find it.' They search during the early morning because they can not drink anything while looking for it—they are afraid of drinking. If they drink water then there will be a great deal of rain which will spoil the dance; they are afraid to wash themselves also and throw out the water. When they find the tree, which must have a convenient location and suitable shape, they come back and tell the Medicine-keeper: 'We have found the tree.' During this time the Taimay keeper does not do any work. When he wants anything done he tells the people and it does not fail; everybody is afraid of him. During the time of different kinds of work they drink no water—everybody is afraid of the Taimay keeper; when the work is over then they drink. When the Taimay keeper announces that they have found the tree, the lodges all move over

near it. They call in the soldiers,—there are five bands of soldiers, each one just like your troop of cavalry. The mounted soldiers move out in front and maneuver in the prairie: then come the lodges with the women and children—soldiers on each flank and rear, just as they used to march moving camp near the enemy; the fifth company (Rattle, foot-soldiers) remains in camp. The Taimay keeper is head of all. He has the Taimay on his back. There are 10 or 20 old men with him. He looks back at the soldiers coming. They arrive and dismount. The soldiers all sing and maneuver as they march. When they dismount the Taimay keeper smokes one pipe of tobacco; then they all remount and start out singing and maneuvering: they go on for about a mile when they halt again. The Taimay keeper smokes another pipeful of tobacco. This is done four times in all, and when the fourth pipe has been smoked everybody has been told where the tree is and all hurry to put up their lodges [Battey says the men rush to strike a pole set up in the new camp site], which are pitched by bands in an incomplete circle, the opening toward the east, the doors of the lodges opening toward the center of the circle. The order of the bands is shownin the accompanying sketch.

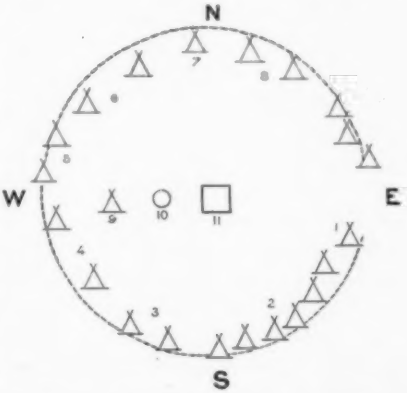


FIG. 53.—Kiowa camp circle. 1, True Kiowa. 2, Elk. 3, Sindays men. 4, Black men. 5, Shield men. 6, Biters. 7, Kiowa Apache. 8, Medicine lodge. 9, Taimay keeper's lodge. 10, Sweat lodge. 11, Medicine lodge.

"The foot-soldiers who remained in the old camp have two horses. They remain there until the village reaches its camp ground: then they send out two mounted scouts; they look for the village just as scouts do when they go to war. After a while they are seen mount-

ing a hill on their return, and they report the village location. Then the foot-soldiers all move out as did the others, making four halts—they make a good line. When the village reaches camp a wide lodge of several lodge-covers is made and food cooked so that the foot-soldiers will have something to eat when they return. They go to the wide lodge and everybody drinks water and eats until sundown. Next morning before sunrise a man goes to look for a buffalo bull—not a cow—a bull. Two men saddle up, go to the Taimay keeper's lodge, and say: 'Wake up! We are going to look for the bull.' The Taimay keeper has a little piece of medicine, 1½ inches long, made of a piece of wood or a root that came from the far north, and it is lent to the man who kills the bull. Other people never have it and do not know what it is. The Taimay keeper says to them: 'Go out on the prairie and find a little herd of buffalo. Have two arrows in your hand—not four; bite off a little piece of that wood, chew it up, and spit on the arrows.' Then he stops, and the two men go out on the right side of the village. The killing of the bull is done by the man who holds the office; nobody else can do it. He must be a man of high standing, able to count coups. Honameatah has it now; Tohansen, his brother, used to have it. They find a small herd of bulls and the buffalo killer starts after them. The other man stays back and watches him. He first counts his coup before he can shoot. He does not shoot two arrows unless the first one fails. He shoots the bull right behind the shoulder. He chases the bull so that when he falls his face will be pointing toward the east, and he falls dead on his belly—not on his side. He dies with his face toward the east and on his belly. That is a wonderful thing. He does it himself. Everybody knows it. He is shot in such a way that no blood comes out of his mouth. In past times when blood has come out of his mouth great sickness has come to the Kiowa, and that is what they are afraid of. They are afraid also if he falls on his side. The bull is generally killed quite early in the morning. When he falls with his face to the east, the other man comes up, looks at him, and says: 'Yes, he is dead.' They picket their horses toward the south. They gather a big bundle of sage grass and bring it to the bull. They put some dried chips about fifteen feet west of the bull and

spread sage on them. Then they go to his head. They have a very sharp knife; a buffalo bull has a very tough skin; it is a two-year old; the skin about the neck is the thickest. Before the buffalo killer can cut the skin he must count a coup or tell where he struck his enemy. He then makes an incision over the right hip bone. He does not saw the hide; he rips it, from the point of incision up to the shoulder, then to the butt of the ear and corner of the mouth, without taking the knife from under the skin. Then he goes to the left hip and rips the hide as he did on the right side without getting in front of the bull. Then he goes back, cuts off the bone of the tail, and rolls the skin of the back until he gets to the horns, and takes the skin of the face all the way to the corners of the mouth and around the nose. Then they lift it up and move backwards, keeping the head toward the east, and spread it out upon the sage. They do not drink any water, but clean meat from the inside of the hide. Then the man who killed the bull brings up the horses and covers his saddle with sage. The horse is held with his face to the east. The skin is unrolled about three feet, the head outside, then put on the saddle. The man goes around the horse's tail to the right side, gets on the horse behind the skin, and makes a prayer to the Sun: 'Look at me, Sun! Let our women and children live good, and buffalo cover the earth. Let sickness be put away.' Then he doesn't turn to the right; he turns always to the left and goes to the village. He trots fast. In the meantime the people are watching for him. When he gets near, he goes slower. The first man who sees him, calls out: 'There he is coming, bringing the medicine bull!' Then he arrives near the end of the enclosure and stops four times. At this time the biggest chief of the Kiowa is in his lodge dressed in a deerskin shirt, with scalps down the breast and arms and down the sides of his leggings. He comes out, everybody watching him. He goes to the horse of the buffalo killer. The horse is facing the Taimay keeper's lodge in the enclosure. He unfastens the hide, going around the horse always by the tail. He gathers the hide and the sage, and puts the hide down on the sage at the Taimay keeper's door. Then the women and children all bring presents and throw them down there and

make a prayer to the Sun. They all have the same prayer: 'Let us all attain to the way-off old persons' road' [i. e., 'Let us all attain old age'], and then they all scatter to their lodges.

"Some time before a big sweat-house has been made inside the enclosure and in front of the Taimay keeper's lodge; it is well covered with robes. After the prayers are all over and the people separate, fire is brought and they put hot stones into the sweat house. Then they bring two chiefs—the one who had the scalp shirt and one other. They come with their backs toward the east, one behind the other, and take hold of the robe with the right hand. The first one takes the robe so that the head laps over the right arm, and they take it into the sweat lodge, carry it around by the south side, and lay it flat with its face to the east. Then the Taimay keeper with a few others also enter. They close the door and put water on the hot stones. Then they open the door for a while. This is done seven times. Then they stop and come out. [Without doubt a series of prayers was offered inside, but the investigation of this was left for another occasion which never presented itself.] Then the two men carry the robe out around by the north side, stopping four times. Then they go inside the door, turning to the south, and lay the hide on the sage prepared for it in the Taimay keeper's lodge, when everything is over for the day. That is the second preliminary day. The next morning, about nine o'clock, they have a sham fight ['a laugh fight'].

"Everybody knows about it. They have breakfast, drive in the horses, saddle up, and mount prepared as for war. They tie up the ponies' tails. Some have guns, some spears with eagle feathers, also shields and warbonnets. The foot-soldier band takes its place in the center of the enclosure. The four mounted bands collect a short distance from the village and come galloping through the gate, turn to the left, go completely around inside the enclosure and out again, turning to the left, keeping around outside, and in again as before. They do this four times, and then go out and stop at some place away from the village. The foot-soldiers then go to where the center tree was found. They make a shield-house [fort] around the tree, and taking their guns, go outside, forming a line

toward the approaching mounted soldiers. The latter charge them, both firing at each other for fun—there are no bullets in the guns. When the horse-soldiers charge they send dust high in the air and the foot-soldiers retire into the fort. The horse-soldiers ride around them, shooting into the fort and striking the foot-soldiers with camp-sticks and spears. So much dust and smoke makes it look like a real fight. When the foot-soldiers get tired they dash out of the shield-house, and that ends the fight. Then they cut down the tree for the forked center pole. It is cut by a woman whose regular office it is to chop the tree—usually a Mexican. All the time I was growing up the same woman cut it. She became old and died, and another woman took up her road. She was a good woman. Her children grew up good, like these children. She was afraid of anything foolish, afraid to do anything wrong. They fell the tree in any direction, and cut the limbs all off, leaving only the two forks. A mounted soldier sees a woman he likes: if she wants him he asks her to ride behind him. Sometimes she says 'yes' and mounts behind him. He has a rope attached to the tree and tied to the saddle, and many of them drag the tree, stopping four times on the way, to where it is to be planted in the center of the enclosure, everybody singing. The outside trees are brought in in the same way. They take the center pole to the hole that has already been dug for it by a band of women soldiers, all women. Only one man is with them, a chief. He puts in the center pole: that is his office. When the middle pole is up, a rope is thrown over the crotch, and the two chiefs bring the robe, tie it to the rope, and many men pull it up to the crotch and tie it so that its face will be to the east, not in the crotch but across the Y. When the dance is finished, the hide is left there. Anybody who rides by and sees it, says: 'Yes there it is. That is the medicine-bull's hide left there.' After the pole is put up and the hide tied to it they stop for that day (3rd).

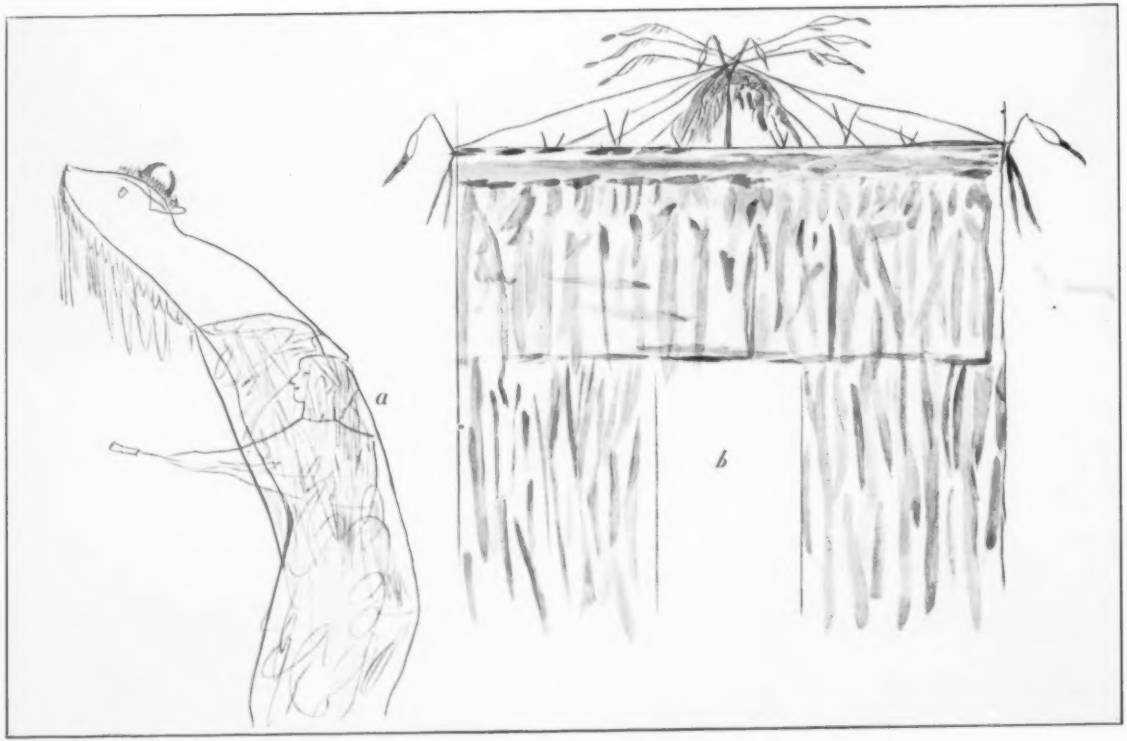
"On the fourth day the wall poles are brought in and planted so as to make the medicine-lodge from 42 to 60 feet in diameter. On the fifth day the walls are made of branches and the roof is finished. When the walls are finished, being wattled, the old women soldiers go out and fill their robes with clean sand, bring it into the

medicine-lodge, and cover the floor all over, and they sweep it out smooth early every morning. The sand is also piled up in a cone around the foot of the middle pole and a flat stone is put in the doorway (pl. XX, *g*, *h*). Whenever a dancer goes out of the lodge he sets his foot on that stone. The walls and roof are finished. On the morning of the sixth day they 'herd' the buffalo. They then take a lot of robes with the heads and hair on them and stretch them on a frame of willows so that a man can get inside of them and look like a buffalo (pl. XXIV, *a*; fig. 54). There are a lot of men and boys and one woman—always the same woman: that is her road [office, custom]—who go out on the prairie without weapons and have a sham fight, butting and kicking each other. After that they assemble with their robes on, the boys with colt robes on, on the plain near the lodges just like a herd of buffalo, some standing and some lying down—a great many of them just like a big herd of buffalo.

"One man, well dressed, appears with a necklace, a quiver, and bow and arrows in his left hand, and a firebrand in his right (pl. XXIII, *a*). He goes along, all the people watching him. The buffalo out on the flat do not see him. He goes into the medicine-lodge and sits down. There are many men in there, and he sits down with them. He says: 'Look at the buffalo out there!' He talks awhile with the Taimay keeper, then goes out and runs over toward the buffalo with the firebrand in his right hand, going to their windward side; they smell the smoke and all jump up and gaze at him and run away from him, just like buffalo. The people in the village all look at them and say to each other: 'They are just like buffalo.' A man with a straight pipe (pl. XXIII, *b*) stoops down, with his back to the Taimay keeper, who stands in the door of the medicine-lodge (pl. XXIII, *c*). When the buffalo jump up he points his pipe at them and draws it back (thus drawing the buffalo). This is done four times, the keeper each time going back toward the door, until the fourth time when he goes in and stands at the west side. The buffalo are drawn in thus by him and run round outside the medicine-lodge four times. Then, entering, they run round the middle pole four times and then lie down. This man is called 'the man who brings the buffalo' (pl. XXIII, *b*), and the one with the lighted

HERDING THE BUFFALO

a. The man who drives the buffalo. *b*. The man who brings the buffalo. *c*. The Taimay keeper.



(*a*) MAN COVERED WITH BUFFALO-ROBE, REPRESENTING A BUFFALO. (*b*) MEDICINE LODGE

firebrand is called 'the man who drives the buffalo' (pl. XXIII, *a*). (Thus they dramatize the old method of taking the buffalo into the pound.)

"Ten men wearing robes come in and sit down, and the whole village comes and stares at the buffalo. Three men then come in, each holding a pipe. These pipes are straight—the bowl does not

FIG. 54.—Man covered with a robe supported with sticks to represent a buffalo.

turn up. They have wooden stems, and are made of black stone, like that black stone pipe Honameatah gave you that used to belong to Old Tohausen who was chief of the Kiowa for so many

years. Those pipes are kept with the Taimay by the keeper, and he lends them to the three men, during the dance. They are very old and belonged always to the Taimay. The three men hold these pipes with mouth-piece presented. One stands still and the other two go and pull the robes off the faces, searching for the man who has counted the most coups. They pull the robe off of a man's face, look at him, and say, 'No that is not the man,' and keep on until they find him. Then they call out his name to the third standing man, who comes and touches him with the pipe and calls out his name as loudly as he can, 'Big Bow is a fat buffalo!' and puts a short stick on his hump (of which he carries four), and everybody claps his hands. This is done four times, one each for the four biggest chiefs who have struck their enemies the greatest number of times. Then all go out, and the sun goes down.

"The first day they move into the ceremonial camp circle. The second they kill and bring in the hide of the medicine-bull. The third they have a sham battle and bring in the middle pole. The fourth they bring in and plant the wall poles. The fifth they put on the roof poles and sides, and sand the floor. The sixth they held the buffalo lodge, and in the evening at sundown the dancers enter the medicine-lodge. That evening at sundown those who are to dance without water go into the medicine-lodge. These men are to dance four days and nights without anything to eat or drink. The Taimay keeper dances with them. If a dancer can not hold out he goes home and gets something to eat and drink but does not go back. A great many begin the first day, but by the next night they begin to leave. They fall in number until the morning of the fourth day. Only a few are then left, five or six, all weak with hunger and thirst. I [I-see-oh] did that once. I was there with them dancing. It was pretty good at night when it was cool, but it was very hot in the middle of the day; we almost died from the heat and want of water. On the morning of the fourth day the keeper encouraged us, saying, 'Try hard now. Try hard. This is the last day. I have the same road that you have. I want you to help me now through to the end,—then at sundown you can eat and drink.' Toward evening he sent some women to bring water·

I looked at that water and longed for it, water hungry. Almost at sundown he took up the Taimay and put it in its sack. He took the same piece of wood or root that was used by the man who killed the bull, powdered a little piece, and put it into the water brought by the women. He said: 'Our father, the Sun, is looking down at you now. He sees you poor and hungry. He is going to help you live a long time; you are going to see your children grow up strong; you are going to have many children.' Then we drank the water and left the medicine-lodge, and the next day the village broke up and moved away.

"When a man goes into the medicine-lodge to dance he has a whistle made from the wing-bone of an eagle and some sage in his hand. I do not know why he has sage. It came to us from the Crows, who first made the Taimay. Every kind of medicine has sage with it. I think Sinday [the Kiowa culture hero] said to do that. We do not cut anybody in the Kiowa medicine-lodge: we are afraid to do that; we are afraid to see blood there. The Cheyenne, Arapaho, and Sioux cut the dancers, but we are afraid of the blood. We do not let the bull get shot through the lungs and belch blood: that would be dangerous; we would have trouble happen to us if he belched blood; we are afraid of it. Before we go into the medicine-lodge the keeper with seven or eight other men (any who wish it among the dancers) go into his tipi, take the Taimay out of its sack, fix it up, put its feather on its head, and tie it on a staff about six feet long. Then they come out, the keeper in front, the others behind in single file, the keeper carrying the Taimay by the staff in both hands in front of him. They stop behind the medicine-lodge, then go around to the left, all the time singing, and stop near the door, go four times round the lodge and then go in (it is empty when they go in), and plant the Taimay in its place in the middle and in front of the cedar screen. In old times the two little ones were planted in the same way, one on each side of the big one and all facing the east, but the Ute got these little ones. The dancers then enter, the singers with a big drum just like that little drum you have [which has but one drumhead]—only this is three feet in diameter; ten persons can drum on it at one time. Then the

spectators enter and there is a fire built a little on one side of the door. The only use for this fire is to tighten the drum head when it gets slack. When the dancers all get in they begin to dance in rows with their backs to the east, facing the Taimay. They stand in one place, bending their knees and raising their heels in time to the drum, extending their hands to and blowing their whistle at the Taimay. Behind the Taimay is a cedar screen extending across the lodge from north to south, leaving doors at each end, the butts of the cedars being out from the wall, the tops inclined against it. Above the cedars are hung the Taimay shields, eight of them. In the middle of the night the dancing stops: the singers, drummers, and spectators go home to bed—the dancers and the Taimay keeper go to sleep.

"Before sunrise next morning the drummers come in and the dancing begins again. There are four men chosen by the Taimay keeper to act for four years to assist him, to whom he teaches the Taimay ceremonies. These assistants have fans made of the tail feathers of the raven. When not in use they are kept near the Taimay. These four men go around among the dancers who rush about inside the lodge intermixed: they move these fans through among the dancers searching for the man they want. When he is found the fans are waved at him horizontally, causing him to jump into the air. Then they are swung spirally in front of him, which makes him turn around and fall down as if he were drunk. This is done three times every day—at dawn, at noon, and just before sunset. It confers long life and health on the persons to whom it is done; this is explained by the keeper when they first enter the lodge, and each time before it is done the keeper bites off some of the medicine root, the same lent the buffalo-bull killer, and chews it up and goes around the lodge spitting it upon the dancers. This is good for them. He explains to them that he has no medicine power himself, but the Taimay sees them: it has medicine power; he himself is only a man. After the running about and [ceremonial] killing, the four men, the drummers and singers, go home to breakfast; the dancers do not eat or drink. About nine o'clock the drummers come back; the dance begins again and lasts until dinner time. A man

gets up and dances when he wants to and then sits down near the wall or behind the cedars. Just before the keeper spits on them incense is burned—cedar leaves. The dancers go around in single file, put themselves in the smoke of the cedar, one at a time, and rub their hands, arms, and bodies in the cedar smoke. They all get up and dance at the same time. Then he spits on them, they run about, and four other men are 'killed.' Then the drummers go to dinner and come back about four o'clock, when they dance again. The running about and killing of four other men is finished just about sundown, and the drummers and spectators go to supper. The dancers rest until after supper, when the drummers come back and the dancing is continued until the middle of the night. This is done every day for four days. Just before sunset on the fourth day the keeper takes the Taimay, takes off its feather, rolls it up, and puts it in its sack. He has two sacks, one for the Taimay and the articles that belong to it, and another for his rabbit-skin cap. They are made of parflêche just like these parflêches you have [to carry dried meat in], only they have a moon painted on them. When the Taimay is put away the water is brought in the vessels. As I told you before, some of the medicine wood, or root, is spit into the pails. The dancers drink very little at a time. If they drink as much as they want, it will kill them. They are allowed only a little at a time until they have got enough. Then the dance is over, and next day the village breaks up and scatters in every direction. The young men go to war against all different kinds of people,—against the Mexicans, Pawnee, or Texans.

"The Taimay keeper dances with the others, and does not eat or drink or go out of the lodge for four days. He is painted yellow all over and has a yellow deerskin skirt made of two deerskins painted yellow. He has sage tied around his wrists and holds cedar in his hand. He wears an eagle-bone whistle around his neck, has a sun painted black in the middle of his breast, another in the middle of his back, a jackrabbit skin cap with a fluffy [breath] eagle feather on his head.[1] The four assistants have each a deerskin

[1] See pl. xx, *i*; pl. xxii, *g*.

skirt painted white and wear their breech-clouts outside, a cap or wreath made of sage with a breath feather, sage tied about wrists and ankles, cedar in the hand, a scalp from one of the Taimay shields on the breast with two eagle tail-feathers attached, two moons painted blue (or green) on the skin, another scalp with feathers and two other blue moons painted on the skin of the back, and the accompanying design painted on the forehead and cheeks (pl. XX, *a*; pl. XXII, *f*). The dancers have no caps but paint themselves, the face and body, white, and wear their breech-clouts outside of their skirts. Each has an eagle-bone whistle. Only the Taimay keeper is painted yellow."

III. How the Kiowa Got the Taimay

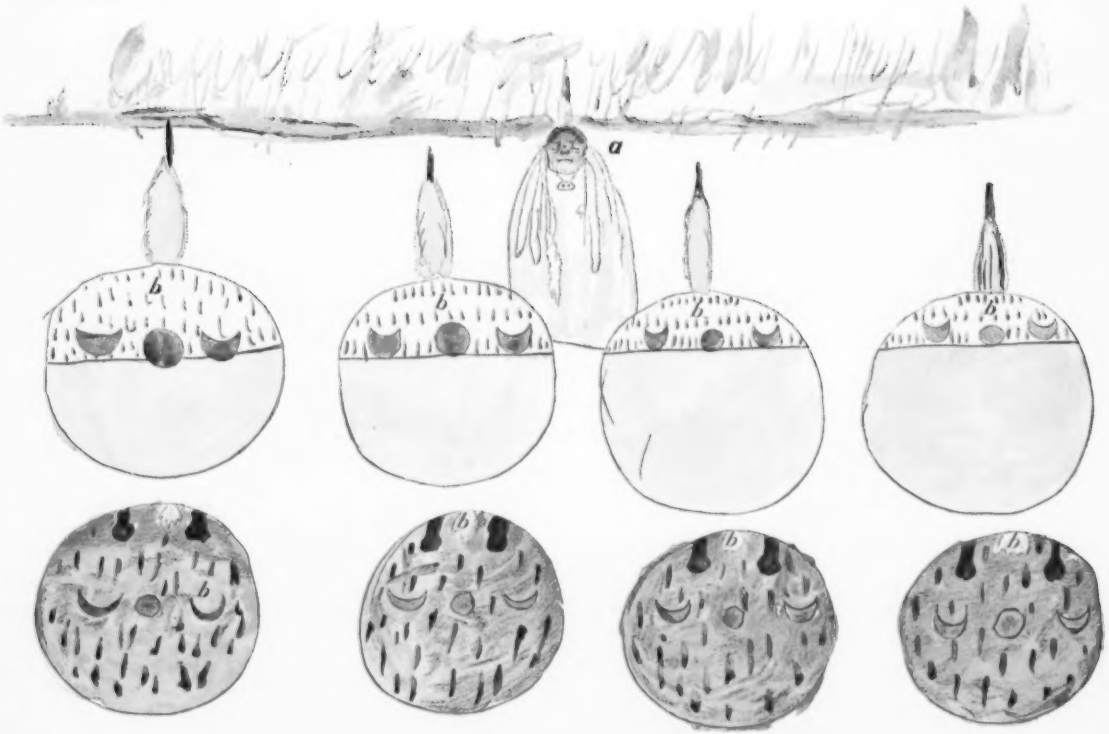
Taybodal (or Shank-of-a-bull's-leg), the oldest living Kiowa, now (1897) about eighty years of age, was found at Horses' Camp, and gave the following account of getting the Taimay:

"While we still lived in the far north and moved our property with dogs, the Kiowa had no Taimay, no Sun medicine.

"One time the Kiowa went to trade with the Crow and took with them an old Arapaho and his wife who lived with the Kiowa and who were very poor and miserable.

"After the trade was over the Kiowa went back. [It is not known whether this "going back" referred to their first remembered home, the "Kiowa Mountains" near the Gallatin Valley in Montana, or whether it was later in their history and they had moved down to the Black Hills of Dakota; the most settled fact in their mind was that they still carried their property by dogs.] The old Arapaho and his wife were too poor and miserable to travel back with them and they were left in the Crow village.

"After some time the Crow chief took notice of them and said: 'I see you there poor and miserable. I am going to take pity on you. I am going to give you some medicine.' And he gave the man the Taimay. After some time the Kiowa went again to the Crow village to trade and, when they left, the Arapaho and his wife went along, taking the Taimay with them, and that old Arapaho made the Sun dance with the Kiowa until he died: then some of his relations took it up.



(*a*) TAIMAY IMAGE. (*b*) TAIMAY SHIELDS HANGING ON CEDAR SCREEN WITHIN THE MEDICINE LODGE.
(THE TOP OF THE SCREEN APPEARS AT THE UPPER PART OF THE PICTURE)

"All the time that I was growing up that old man On-so-teen (Long-foot) had it. He was old when I saw him first, and he grew older and older as I grew up and up until his ribs collapsed and he died old, *i. e.*, he died of old age.

"He died at the Sand hills on Elk Creek the winter Fort Sill was established [1870]. He got the Taimay when he was a young man and died a very old man. He made a great many dances. The next man who took it up was Many Stars; his other name was Got-no-moccasins.[1] He made two dances, omitted the third, made the fourth, and died the following fall of a fever ('sick, hot died'). Many Stars' own brother, Many Bears, then took it up. He was a nephew of that Many Bears who was killed before by the Ute on the north side of the main Canadian where the spring is, at the mouth of the little creek. He had it four years and made four dances and then fell sick and died of a fever. After him Taimeday (Standing Taimay), his own brother, took it. Taimeday made three good dances. The time for the fourth arrived but the soldiers stopped it.[2] Now a woman has it, Long-foot's daughter. Her name is Ee-man-az, 'Food-giver.' Lucius Aitsans' father, Looka, knows how to make the dance. I have heard that four men got the Taimay while they were still young and died old with their ribs collapsed, and Long-foot was the fifth, whom I saw myself. They must have had it seventy years each.

"That old man's name was On-so-teen, which means 'Long-foot.' His other name was Tonanti, an Arapaho word: we do not know what it means."

IV. Age of the Taimay

Concerning the antiquity of the Taimay we can only speculate, guided by the light of tradition checked by our earliest records. Mr Mooney thinks the Kiowa obtained it about 1765.[3] The writer has long believed that sufficient time has not been allowed for the

[1] Battey, p. 183.

[2] The writer was with the command ordered from Fort Sill to Anadarko in the spring of 1890 at the request of Agent Meyers to stop this dance. The command included three troops of the 7th Cavalry under Lt. Col. Caleb H. Carlton.

[3] *17th Ann. Rep. Bur. Am. Eth.*, 1898, p. 155.

sojourn of the "central group" of Dr Wissler on the Plains and for the development of their distinctive culture. For instance, it is said on the authority of the Dakota winter count that the Dakota did not discover the Black Hills until 1775 or 1776;[1] whereas, La Verendrye reports the "Gens de la Flêche Collée ó Sioux des Prairies" near the Black Hills and probably in sight of them in 1742.[2] (The writer has seen the Black Hills eighty miles away, towards the Missouri.)

Clark[3] and others state that the separation between the Northern and Southern Cheyenne and Arapaho did not take place until about 1850, but it has been pointed out in this periodical[4] that it was already an accomplished fact in 1816. Again Wissler says:[5] "The general suggestion seems to be that in so far as the Plains Indians are a buffalo using people and have a culture dependent on the same, their type of civilization is of recent origin and developed chiefly by contact with Europeans, upon this assumption it appears that the peopling of the Plains proper was a recent phenomenon due in part to the introduction of the horse and the displacement of the tribes by white settlements"; and[6] "Indeed it is difficult to see how the central groups as noted above could have followed their roving life without this animal (the horse)." Wissler appears to give but the short period from 1750 to 1800 for the development of the Plains culture, and says, "We have no information as to the ethnic conditions in this area before the introduction of the horse."

To this I disagree, for it seems very clear, from the accounts of the historians of Coronado's march,[7] that there were roving tribes following the buffalo in the Plains of Texas in 1542 which transported their property by means of dogs and which in all probability then saw and heard of white men and horses for the first time. They had already developed the sign language of the Plains and their exterior life corresponded in every particular with the description given by the Kiowa

[1] Ibid., p. 157.
[2] Margry, *Découvertes*, VI, p. 610.
[3] *Sign Language*, p. 101.
[4] *Am. Anth.* (N. S.), vol. 9, p. 545, 1907.
[5] *Congrès International des Américanistes*, XV Sess., II, Quebec, 1906, p. 45
[6] Ibid., p. 44.
[7] Winship in *14th Ann. Rep. Bur. Am. Eth.*, pp. 527, 578, 588.

of their life on the Plains of the north before the acquisition of the horse. Motolinia[1] says:

"Andando muchos dias por estos llanos [east of the Pecos river], toparon con una rancheria de hasta ducientas casas con gente: eran las casas de los cueros de las vacas adobados, blancas, á manera de pabellones ó tiendas de campo.

"El mantenimiento ó sustentamiento de estos indios es todo de las vacas, porque ni siembran ni cogen maiz: de los cueros hacen sus casas, de los cueros visten y calzan, de los cueros hacen sogas y tambien de la lana: de los niervos hacen hilo con que cosen sus vestiduras y tambien las casas: de los huesos hacen alesnas: las boñigas les sirven de leña, porque no hay otra en aquella tierra: los buches les sirven de jarros y vasijas con que beben: de la carne se mantienen; cómenla medio asada . . . Tienen perros como los de esta tierra, salvo que son algo mayores, los cuales perros cargan como á bestias y les hacen sus enjalmas como albardillas y las cinchan con sus correas, y andan matados como bestias en las cruces. Cuando van á caza cárganlos de mantenimientos, y cuando se mueven estos indios porque no están de asiento en una parte, que se andan donde andan las vacas para se mantaner, estos perros les llevan las casas, y llevan los palos de las casas arrastrando atados á las albardillas, allende la carga que llevan encima: podrá ser la carga, segund el perro, arroba y media y dios."

Fray Alonso de Benavides says[2] (1630) in regard to the Apaches vaqueros del ganado de Síbola: "Que cuando estos indios van á tratar y contratar, van las rancherias enteras con sus mujeras é hijos, que viven en tiendas hechas de estos pellejos de Síbola muy delgados y adobados: y las tiendas las llevan cargadas en requas de perros aparejados con sus enjalmillas, y son los perros medianos, y suelan llevan quinientos perros en una requa, uno delante de otro, y la gente llevan cargada su mercaduria que trueca por ropa de algodón y otras que carecen." This is corroborated by Gaspar Castaño de Sosa in 1590,[3] by Le Page du Pratz in 1724,[4] and by others.

[1] *Memoriales de Fray Toribio de Motolinia*, Mexico, 1903, pp. 351–352. Compare also Relacion del Suceso, p. 578, and Jaramillo's narration, p. 588, *Fourteenth Ann. Rep. Bur. Am. Eth.*, pt. 1, 1896.

[2] *Historia de Nueva Mexico*, by Gaspar de Villagran, reprint Mexico, 1900, app. 2, p. 45.

[3] *Docs. inéditos del archivo de Indias*, XV, p. 209.

[4] *Hist. de la Louisiane*, III, p. 163, 1758.

When questioned upon the age of the Taimay and the southern migration of the Kiowa, a frequent topic of conversation in those days (1889 to 1897), Taybodal and other old Kiowa said that Tonanti was the fifth man to hold the Taimay from youth to extreme old age, each having a term of about seventy years, making no account of those who, like "Many Stars," had it for a short term only. Taybodal was mistaken, however, as to Tonanti, for we know from other sources[1] that he held it for not more than forty years. Should we allow the other four men a like period their combined terms would aggregate two hundred years from 1870, the date of Tonanti's death, thus taking it back to the year 1670. There must have been numerous short-term men scattered through their history, as happened during the twenty-seven years after Tonanti's death, for it is not to be believed that five such long-lived men would follow one another in succession in the history of any people, but of these no account is taken.

Furthermore La Salle has left us a statement[2] that the Gattacka and Manrhoat were south of the Pawnee in 1681. The former is the Pawnee name for the Kiowa Apache,[3] who stoutly asseverate—and the Kiowa agree with them—that they migrated from the north together and have been together practically ever since. The name Manrhoat may well be, as Mooney thinks, the name of some other tribe for the Kiowa, whence it is more than probable that the Kiowa and Kiowa Apache were on the Canadian and Arkansas before 1681, wandering, as they were reported to the Secretary of War from Fort Gibson, September 15, 1835: "The Kioaways have no fixed villages but wander from the Cross Timbers on the Arkansas, Canadian and Red Rivers to the Rocky Mountains and are sometimes but not often south of Red River—signed Montfort Stokes, M. Arbuckle."[4]

In the list of Spanish documents copied by Bandelier and exhibited at the Columbian Historical Exposition at Madrid, 1892 (p. 323, No. 19), was a copy of an order of the Vicar Don José de

[1] Mooney in *17th. Ann. Rep. Bur. Am., Eth.* p. 241.
[2] Margry, *Découvertes*, II, p. 201.
[3] Mooney, op. cit., p. 248.
[4] Transcript Sup. Ct. Record, U. S. vs. Choctaw, Chickasaw, etc., p. 138.

Bustamente to Father Fray José Antonio Guerrero, Minister at Santa Fé, to marry a Panana (Pawnee) Indian to a Cargua woman, both servants. This is from the Archives of the Parish of our Lady of Guadalupe of Paso del Norte, Mexico, 1732, and Document No. 20 is a copy of their marriage notice.

Another fact bearing on this subject is that the Kiowa have lived so long south of the Pawnee that they call the north star the "Pawnee star" and assert that the Pawnee towns were right under that star, for in following the Pawnee horse raiders they would always follow their trail by day, and when prevented by darkness they could always keep on all night toward the north star, and be sure of picking up the trail in the morning. As the Kiowa Apache stoutly support the Kiowa in declaring that they got the Taimay in the north before their southern migration together, it follows that in all probability they had already acquired it previous to La Salle's statement of 1681, and the chronology of Old Taybodal may not be far wrong.

V. Tabus, or "What the Sun Dance Shield Keepers Are Afraid of"

"That old man An-so-teen (Long-Foot) gave them Taimay shields and told them what to be afraid of. He died about 1870, very old. He had had the Taimay since he was a young man. The Taimay shield keepers are afraid to look at themselves in a glass; if they do their eyesight will be ruined. They must not eat buffalo hearts, or touch a bearskin, or have anything to do with a bear; they must not smoke with their moccasins on, or kill, or eat any kind of rabbit, or kill or touch a skunk.

"Bird shield keepers must not touch birds nor throw feathers into the fire nor put a knife in the fire in a tipi; if you cook something for them and the knife touches the fire they will not eat what you cook for them. They must not eat a heart of any kind. You must not cook a heart in such a man's kettle. His wife and children must not eat a heart or any kind of bird because he keeps a bird shield. Santanta had a crane shield. You know about that: you have that shield yourself. Every shield keeper is afraid of something

[*i. e.*, has tabus]. The buffalo shield keeper is afraid of raw liver or anything raw from the inside. He is afraid of putting a buffalo horn into the fire in his tipi. He is afraid to take a pipe-stem above, always takes it below your hand. That is his road. He may be afraid of other things too."

VI. Conclusion

It is only when studied in connection with the spring festivals of other peoples that the Sun dance of the Plains Indians is seen in its true light. It then takes its place at once among its kindred phenomena as one of a world-wide series of religious dramas, symbolizing the regeneration of life. It is the worship of the Sun Father whose symbol in the countries of the Old World has been the "phallus," giving rise to its designation as a "phallic cult."

To the Indian the winter is a season of old age or death, all vegetation that produces life is old and worn out or dead; but when the sun shines warm in the spring, the rains come down from above and fertilize the earth, the grass upon which the animals feed comes to life and springs up from the ground, the buffalo drop their calves, the birds and fish lay their eggs, then all nature rejoices in a new birth. The Above Father (the Power in the Sun) has brought this about in conjunction with "Our Mother the Earth." The Indian believed in the dualism of nature, that there can be no birth without sexual intercourse, without sacrifice and suffering, and the acts of the Sun dance symbolize these or relate to making plenty the buffalo upon which they lived.

Every step of this ceremony he regarded as pure and holy, and in following it out the Indian was as sincere and reverent in his worship as any churchman of our time.

Some of the acts observed, as those related by G. A. Dorsey in the case of the Lodgemaker's wife and the High Priest in the Cheyenne and Arapaho Sun dances,[1] have shocked those who have not looked beneath the surface, remembering the stage of culture in which we found the Indian and through which our own forefathers have passed.

[1] *Field Columbian Museum Publication* 103, p. 131, and no. 75, p. 172.

To properly understand this we must compare the history of other primitive peoples in different parts of the world, keeping constantly in mind the difference between the world of myth and fancy inhabited by the Indian and that which we call the world of reality. We must remember that the acts we complain of were commanded by his religion, which was handed down to him by his forefathers, and that, in his mind, upon the proper observation of its rites and ceremonies depended the life and prosperity of his people.

We shall then be able to consider these acts, not with the horror that would naturally be called forth by similar acts today among our own people, but with kindly tolerance as part of the religious culture of the bygone age to which they really belong, when man, creeping slowly upward from the brute, had not yet attained to higher things.

We shall be assisted to this view by a reference to the account of Herodotus of what was done in the name of religion in the temple of Mylitta in Babylon nearly five hundred years before Christ by a people undoubtedly as sincere as we are, and the following references will further broaden our vision as to the extent covered by the worship of the Sun and Earth as our parents.

16th Century. The Florida Indians "have no knowledge of God nor any religion saving that which they see as the Sun and Moon."[1] "It is to be noted for a general rule that these people in all the continent of these Indias from the farthest parts of New Spain to the parts of Florida and farther still to the Kingdoms of Peru had, as has been said, an infinity of idols that they reverence as Gods, nevertheless above all, they still held the Sun as chiefest and most powerful.[2] Chichimecs and Aztecs, likewise Comanches,[3] use the Sun and Earth as mediators.[4] Nezahualcoatl recognized the Sun as his father and the Earth as his mother."

1630. Apaches of the Rio Grande. "Dijo asi: 'Padre, hasta

[1] French, *Hist. Coll. La.*, 1869. History of the first attempt of the French to colonize the newly discovered country of Florida, by René Laudonnière, pp. 165–362.

[2] Acosta, p. 334, quoted in Bancroft, *Native Races*, III, p. 194.

[3] Ibid., p. 170.

[4] Ibid., p. 193.

ahora no habíamos conocido otro bienhechor tan grande como el sol y la luna, porque el sol nos calienta y alumbra de día y nos cría las plantas, y la luna nos alumbra de noche; y así adorábamos á estos dos como á quien tanto bien nos hacía, y no sabíamos que había otra cosa mejor."[1]

1680. "Indians of the Mississippi had a particular veneration for the Sun which they recognize as him who made and preserves us."[2]

1699. "The Hurons believe as well as the Nachez that their hereditary chiefs are descended from the Sun."[3] The Detroit Indians "Priat le soleil."[4]

"Shakuru, the Sun, is the first of the visible powers to be mentioned. It is very potent; it gives man health, vitality, and strength. Because of its power to make things grow, Shakuru is sometimes spoken of as atius, father."[5]

That this reverence for the Sun may be shown not to have been confined to the New World or to a recent period we mention the account of Herodotus[6] of the interview of Queen Tomyris of the Massagetæ, nearly five hundred years before Christ, with Cyrus the Great, to whom she said: "But if thou wilt not do so, I swear by the Sun, the Sovereign Lord of the Massagetæ, that thirsty though thou be, I will satiate thee with blood." Again, "of all the Gods, they adore the Sun alone to whom they sacrifice horses."[7] Further information on this point has been gathered by Dr E. B. Tylor in his *Researches into the Primitive Culture of Mankind*,[8] where he gives the statement of the treaty oath between Philip of Macedon and the general of the Carthagenian Libyan Army, where they invoked the Sun, Moon, and Earth among other Gods, to its sacredness. And the Brahman makes the following prayer to the Sun: "Oh Sun God! you are Brama at your rising Rudra at noon and Vishnu at

[1] Benavides, in Villagran, op. cit., pp. 35–36.
[2] Father Membré in *Hist. Coll. La.*, part IV, p. 182.
[3] Charlevoix, in French's *Hist. Coll. La.*, 1851, p. 162.
[4] Margry, *Découvertes*, V, p. 115.
[5] Miss Alice C. Fletcher, The Hako Ceremony, *22d Rep. Bu. Am. Eth.*, pt. 2, p. 30.
[6] P. E. Laurents' translation, Oxford, 1827, vol. I, p. 94.
[7] Ibid., p. 95.
[8] Vol. II, p. 301.

setting; you are the jewel of the air, the king of day, the witness of everything that takes place on earth; you are the eye of the world, the measurer of time; you order the day and night, the weeks, the months, the years, deign in your mercy to put away all my sins." [1]

The idea of the "Earth Mother" is further elaborated by Tylor.[2] "In Barbaric theology Earth is the mother of all things. No fancy of nature can be plainer than that the Heaven Father and Earth Mother are the universal parents." And Tylor quotes[3] in support of this the Aztec prayer to Tezcatlipoca: "Be pleased oh, our Lord that the nobles who die in war be peacefully and joyously received by the Sun and Earth who are the loving Father and Mother of us all." Lastly he says:[4] "Among the Aryan race there stands wide and firm the double myth of the two great parents, as the Rig Veda calls them; they are Dyaus Pitar, Zeus Pater, Jupiter, the Heaven Father and Prithivi Matar the Earth Mother." The same belief is held[5] in China, Polynesia, Peru,[6] among the Caribs,[7] and Comanche. Many other examples could be cited, but nowhere has the writer seen the whole matter summed up as well as in *Sex Worship*, by Clifford Howard,[8] from which the following extracts are taken:

"No subject is of greater importance and significance in the history of the human race than that of sex worship, the adoration of the generative organs and their functions as symbols of the procreative powers of nature. It was the universal primitive religion of the world and has left its indelible impress upon our ideas, our language and our institutions. . . . . It [phallic cult] was the worship inspired by the phenomena of nature in her great mystery of life, and while its resultant mythologies and attendant ceremonials were carried and adapted from one nation to another, it had numerous independent originations; for the human mind,

[1] *Hindu Man., Cus. and Cer.*, Abbé Dubois, trans. Henry K. Beauchamp, Oxford, 1899, p. 245.

[2] *Anthropology*, p. 359.

[3] *Anthropology*, p. 327.

[4] *Primitive Culture*, I, p. 327.

[5] Ibid., p. 325.

[6] Ibid., p. 326.

[7] Ibid., p. 327.

[8] Published by the author, Washington, 1897

as a whole, is always affected in the same way under similar conditions, and the wondrous phenomenon of procreation has ever aroused in primitive man a deep and religious reverence for the animating powers of life.

"While the highest development of phallicism was reached by the ancient Egyptians, Hindoos, Assyrians, Greeks and Romans, whose records and remains abound in evidence of the phallic basis of their elaborate mythologies and religious celebrations, the existence of this early form of religion is to be found in every part of the globe inhabited by man. Babylon, Persia, Hindustan, Ceylon, China, Japan, Burmah, Java, Arabia, Syria, Asia Minor, Egypt, Ethiopia, Europe, the British Isles, Mexico, Yucatan, Peru and various other parts of America—all yield abundant evidence to the same effect and point to a common origin of religious beliefs.

"It must not be imagined, however, that phallic worship is a religion belonging entirely to the past ages. It is common among primitive races among all parts of the world today; and in India, where this form of religion has existed uninterruptedly since its foundation, thousands of years ago there are upwards of one hundred million true phallic-worshippers. Among the Zuñi and other North American tribes phallicism enters into a number of their religious ceremonies, while the natives of the Pacific islands and certain parts of Africa are most ardent devotees in the worship of the procreative functions, and exhibit their religion in the realistic and unequivocal manner of primeval naturalness [pp. 7–9].

"But foremost among all natural emblems of the creative deity was the sun; nay, the sun was the Creator himself, the Almighty God. It was he who gave light and life to the world; upon him all existence depended. Osiris dwelt in the Sun as the Omnipotent Creator, and through this all-potent medium manifested his powers to mankind. All of the ancient supreme gods were closely allied with the sun. It was either the Deity himself or his glorious and almighty manifestation. The worship of the sun, therefore, necessarily formed a part,—a very important and significant part,—of phallic worship. In the adoration of the sun as the Creator and Preserver of mankind lies the origin of a universal theological belief [pp. 75–76].

"This divine, actuating force of nature owed its sacredness to the fact that it was the necessary and inciting means to the accomplishment of the supreme life-purpose of man and woman—the union of the two for the reproduction of life and the perpetuation of the race. It was in the gratification of the Divine Passion that man experienced his most exalted pleasure, and beheld the direct and immediate cause of a new being and

the immortality of life. Hence, the act of generation . . . was regarded as supremely sacred and divine. It was the sublime means ordained by the Creator for the fulfillment of his infinite purpose, and . . . was regarded as a most holy act and was the object of universal worship and devout, religious rites [pp. 130–131].

"The mysteries of Isis and Osiris, of Egypt, the mysteries of the Babylonians, the Eleusinian mysteries of the Greeks, the mysteries of Bacchus and Venus at Rome, together with many others of lesser importance, were all festivals in celebration of the new-born life and the regenerative union of the creative elements of nature. They all set forth and illustrated by solemn and impressive rites and mystical symbols the grand phenomena of nature in its creation and perpetuation of life. In the Eleusinian and Bacchanalian mysteries "the gravest matrons and proudest princesses apparently laid aside all dignity and modesty, and vied with each other in revelry. . . . And these enthusiastic devotees willingly gave themselves up to the embraces of the no less enthusiastic worshippers of the opposite sex, in the nocturnal ceremonies, that had for their object the glorification of the deity in the divine act of generation [pp. 158–160].

"The Liberalia, the Floralia, and the festival of Venus were popular vernal festivals celebrated by the Romans in honor of the procreative deities and their vitalizing function. . . . These springtime festivals, in celebration of the resurrected life and the generative powers of nature, were common among all nations from the earliest times, and it is in some of the particular forms of these celebrations that we find the origin of our own joyous festival—Easter [pp. 162–163].

"It matters not to what race nor to what age we turn, we ever find the same reverent regard for the regeneration of life. Through all the myths and ceremonials of the world, however extravagant or inconsistent many of them may appear, we trace the constant aim of mankind to glorify the Creator and to honor him by the celebration of rites and festivals demonstrative of the adoration of mankind for his supreme powers, wisdom and goodness, while beneath them all lies the universal actuating reverence for the great and unsolvable mystery of procreation—the foundation of all religious worship" [p. 166].

WASHINGTON, D. C.

PHONETICS OF THE MICRONESIAN LANGUAGE OF THE MARSHALL ISLANDS

By A. L. KROEBER

A PHONETIC survey of a number of American Indian languages recently carried on at the University of California revealed certain features common to a number of these tongues that in other respects are distinct. Particularly the stopped consonants are in many cases characterized by being organically only one at each point of articulation, and differentiated according to position in the word. Those that precede vowels are in many languages neither wholly surd nor wholly sonant but "intermediate." The author's record some years ago of a number of words from the dialects of Mortlock and Ponape in the Caroline Islands showed so great an inconsistency in the writing of surd and sonant stops as to force the suspicion that an analogous situation existed in these languages, in that there might be only one series of intermediate stops. The Polynesian languages possess only one class of stops, indicating the possibility of a further case of the occurrence of intermediates; and this is rendered more probable on account of the occasional employment of sonant stops in the early writing of these tongues, whereas the modern standardized orthography recognizes only surds. Compare taboo and tapu.

The arrival at San Francisco in April 1911 of the German trading schooner *Triton*, with a crew of Marshall Islanders, furnished an opportunity to ascertain whether this phenomenon of intermediates, or any others of a similar nature, extended to other regions than the western part of North America. Through the courtesy of Captain Othmer, the desired work was made possible. The *Triton* remained in the harbor only a short time, and the crew was generally needed for work about the vessel. The opportunities for study were therefore limited; but the willingness of several of the natives, especially of Hans Taramij, made it possible to obtain information as to some of the principal phonetic features of the language.[1]

[1] The *Triton* was lost within twenty-four hours after sailing from San Francisco. The entire crew returned safely in a life boat. The author's informants, however, had deserted before the vessel left port.

As Father B. A. Erdland's dictionary and grammar of the Marshall dialect, which were published in 1906 as the fourth volume of the *Archiv für Deutsche Kolonialsprachen*, are based on a far more extended acquaintance with the language than the author could hope to attain, it was decided to devote the available time to mechanical experiments, which do not appear to have been made for any Micronesian or in fact any Malayo-Polynesian language. The apparatus consisted of needles attached to rubber diaphragms at the end of tubes, inscribing on smoked paper covering a revolving drum. About four hundred tracings were secured simultaneously from mouth and throat, nose and throat or mouth and nose, or from the mouth alone. A selection from these is reproduced in the appended plates.

Father Erdland's orthography, while perhaps not above criticism on theoretical grounds, seems to be practically satisfactory, as he appears to have distinguished all the sounds of the language and to have represented them consistently. His choice of characters has therefore been followed here. That his description of the sounds is somewhat incomplete, certain of the most remarkable phenomena not being mentioned, is not surprising, as many of these traits are so unusual as to be possible of detection only by a practiced phonetician or through laboratory facilities.

Vowels

Tracings of vowels do not lend themselves readily to analysis. A few aural impressions may therefore be in place. Erdland gives the vowels as i, e, a, o, u, with the additional umlaut qualities ä, ö, ü. Two mixed vowels of ö and ü type certainly occur; but they are considerably different from close and open ö and ü of German. The sound ä is of another character, being essentially an open e. O has two qualities, the more open of which is distinguished by Erdland as ô. Thus tô, rope, nearly like English taw. The other o is closer, but probably not so much so as in English or German "so." Its quality is probably between that of open and close o in most west European languages. The relation of ä and e seems to be parallel to that of ô and o. For i and u a similar distinction was not observed: each seemed to be, analogous to

o and e, midway between the close and open qualities of the same sound as spoken by Europeans.

All initial vowels were generally heard with a preceding aspiration. This is weaker than English h, and has not been recorded, or at least not written, by Erdland. As it is the normal approach of every initial vowel, its orthographic designation is perhaps unnecessary. The natives accept either hemen or emen as correct renderings of their word for four; probably 'emen comes nearest a true representation. In the tracings the aspiration usually shows as a slight rise preceding the voice vibrations of the vowel. That at times it does not thus appear is probably due to the weakness of the sound.

It will be seen that initial voiced consonants in Marshall normally begin with a flow of surd breath; that is to say, sonancy commences only some time after the sound is under way. The aspiration of initial vowels is evidently only part of the same tendency.

W, pronounced as in English, according to Erdland, did not appear in the words observed by the writer.

Stops

Stopped consonants are formed in three positions, corresponding to p, t, and k. T is dental. K is more forward than in most American Indian languages, which on the whole form the sound farther to the rear than English, German, or French.

The character of the stopped consonants differs radically according to their position in the word, at least as much as has been noted in any American language.

In initial position it was found that sonancy regularly commenced a very short time, averaging probably less than a twenty-fifth of a second, after the beginning of the explosion. This is exactly the condition ascertained for most of the languages of California. In short, the Marshall initial stops are intermediate between true surds and true sonants, the occlusion and beginning of the explosion being unvoiced, the greater part of the explosion voiced. After its first inception, the voicing increases very rapidly, reaching a maximum, which surpasses the strength of the voicing of the fol-

lowing vowel, within a very few hundredths of a second. In most American languages, the commencement of the vibrations of the vocal chords in intermediate stops presents a different character in tracings: the needle connected with the throat drops a short distance, indicating a slight retraction of the surface of the larynx, and at the same time the vibrations begin to appear, increasing in strength more gradually than in the Marshall records. Otherwise the sounds seem identical in the two groups of languages.

As regards strength of explosion, the Marshall initial stops resemble European surd stops, though they lack any sustained aspiration or rush of breath.

Erdland, while denying a p, writes both t and d, k and g. After a little familiarity with native words, these sounds are usually recognizable as distinct, though they are far less different than in English. An examination of tracings of words commencing with t and k as compared with d and g however fails to show any difference between the two classes as regards either duration or strength of sonancy, force of explosion, or continuance of aspiration. But, strange to say, it was discovered that in words written by Erdland with an initial surd stop, the occlusion is normally somewhat longer than in those of which the first sound is represented by a character for a sonant stop. This difference is clearest for the dentals. In "d" the occlusion is almost always less than a fifth of a second; in "t" it lasts from a fourth to a third of a second. For "g" and "k" the observed difference is not so pronounced, but the average duration of the occlusion in the former sound runs somewhat below and of the latter above a fifth of a second, corresponding to tracing lengths of respectively less and more than a centimeter. It is remarkable that two sounds that appear to be identical except for this difference in duration of occlusion should to the European ear give somewhat the effect of sonant and surd stops.

In *medial position*, at least between vowels, the sounds written as stops by Erdland were usually heard and always observed as fricatives, and generally voiced. The tracings present a marked dip, though without the definite vertical and horizontal contour of stops. The voice vibrations usually show through the whole period of the sound both in the mouth and the throat record, though

in some instances enough of the original stop character, with its surd occlusion, remains for at least part of the fricative to be unvoiced.

A similar tendency toward the substitution of fricatives for stops was at times noted in initial position, though less regularly than medially, and usually confined to the explosion. That is to say, such modified initial sounds usually show at least some remains of an occlusion, but the curve for the explosion is that of a fricative instead of a stop. They are probably not mere affricatives, as tracings of these normally present the character of stops. This fricative quality of initial stops was sometimes also perceived by the ear; and, in their imperfect rendering of English, the natives employ initial stops and fricatives almost indiscriminately. Thus "flenty" for plenty, but "pish" for fish; "thongue" for tongue; and either "shome" or "djome" for some.

Final stops possess a firm occlusion, but no perceptible explosion from the mouth. The lips or tongue make a closure which is either indefinitely sustained or concluded after the breath pressure necessary for speech has ceased. Hence final stops are very faint to the ear. Bād, smoke, is not quite bāt and almost bā; "Gilbert" is either kilua or kiluat. In some cases a distinct explosion through the nose was observed, and a tube from the nostril to a flame usually showed a puff when the explosion would be expected in an English stop. Many tracings from the nose however reveal no explosion whatever; so that it is possible that the nasal explosion is due merely to an occasional unintended opening of the naso-oral passage before the release of the mouth closure and cessation of breath pressure. If the sounds are essentially nasal stops, they differ from m, n, and ñ in that they possess an occlusion which is complete for nose as well as mouth. They certainly do not markedly resemble final nasal continuants, although these, like final stops, are entirely surd in the Marshall dialect.

Erdland writes both d and t, but only b and k, at the end of words. As in the case of initial stops, these show no difference in point of sonancy, which, as just stated, is completely lacking. It seems that there may be a longer occlusion for t and k than for d and b, just as when they are initial; but this is not certain, as

the end of the occlusion is discernible in but very few tracings.

Stops closing syllables that precede a consonant are treated as final. In bödökdök, blood, the first k is of final quality, the following d initial, and only the first d of medial character. Erdland says that in such words the final surd stop of the first syllable often becomes sonant—and presumably fricative—and is followed by a vowel. In conformity to this statement, nugenuk and bödögödök were sometimes heard instead of nuknuk and bödökdök; but the majority of tracings do not show the change.

Nasals

The nasal continuants, m, n, ñ, correspond to b, d, g in position of articulation. They also resemble the stops in being at least partly voiced when initial, formed with imperfect mouth closure when intervocalic, and entirely surd when final. Initial sonancy commences gradually and some cases were observed where it seemed to begin after mouth closure, so that the first part of the sound would be surd. Medial nasals are heavily voiced, and, as the vibrations show in mouth tracings, it appears that the mouth is closed imperfectly. The metal mouthpiece employed has been found by the writer to interfere at times with tight lip closure after a wide vowel, so that an effort at clear enunciation is often necessary to produce a true closure effect for medial m. In the Marshall tracings, n, to which this defect of the apparatus would not apply, is, however, recorded as voiced from the mouth as well as m, and medial m shows much heavier vibrations than those occasionally traced in English words: so that it is clear that the typical intervocalic nasals in Marshall are made with very loose contact of the mouth parts. The surdness of the final nasals is usually complete; sometimes the voice of the preceding vowel continues to die away in the first part of the succeeding nasal. This is a phenomenon that has been observed in several American languages.

It is obvious that the difference shown by stops and nasals, according as they are initial, medial, or final in Marshall, does not point to so many organically distinct classes of sounds, but to a single sound of each type which becomes radically modified according to its position in the word.

P. Paulinus (*Anthropos*, v, 809–810, 1910) has described not only p, t, and k, but m, n, l, f, and th as occurring in the Micronesian dialect of Yap, in the Caroline Islands, with accompanying glottal closure. The effect of some of these sounds must resemble somewhat that of the final stops and nasals of the Marshall dialect, but neither observation nor mechanical records have given any indication of glottal affection, nor of independent glottal stops, in this dialect.

Affricatives

Erdland writes j with the value of English j, that is dj. This affricative was found to agree exactly with the stops in its essential features. It is "intermediate" as to sonancy when initial, surd and without explosion when final, and frequently with slurred occlusion and explosion, that is, an approach to fricative quality, when intervocalic. The average length of the occlusion in initial position is less than a fifth of a second (9 mm.), and thus of the "d" rather than "t" type.

Marshall j corresponds to usual Malayo-Polynesian t or s: jilu, three, tol; meja, eye, mata; lo-jiliñö, ear, teliña; juon, one, sa.

Laterals

Erdland distinguishes two l sounds, l and *l*. In regard to the latter he says that it sounds "als ob ein l anklingt dem ein nachdrücklicheres in Verbindung mit dem folgenden Vokale folgt." The difference between the two sounds is difficult to perceive, and tracings of them are similar. Both are voiced. Records of both show a drop or dip near the beginning of the sound. English medial l usually begins with a drop and ends with a sudden short ascent. It is thus registered at a lower altitude than the adjacent vowels, no doubt because the partial closure of the mouth by the tongue permits the escape of less breath. In most American languages, on the other hand, tracings of l regularly commence with, and often largely consist of, a single marked dip, that is to say, a prominent drop and quick recovery. The cause of this form of record is unexplained, unless it is due to a more sudden lateral movement of the tongue than in English. Marshall l and *l* are intermediate between the English and American Indian types, both forms having

been recorded. Erdland suggests that *l* may be analogous to *r*, which appears to be a stopped sound. No trace of an occlusion was however found in any tracing of *l*, so that this supposition does not seem probable. When l and *l* are initial, tracings show a regular rather slow rise of the breath pressure for some time before sonancy sets in. Final l and *l* seem to begin as sonants but to lose their voice before completion.

Both Marshall l and *l* seem to correspond to Malayo-Polynesian l-r: *l*o, tongue, lida, arero, lapi; a*l*, sun, alo, ari.

Trills

Erdland recognizes also two r sounds, r and *r*, which proved to be somewhat easier to distinguish than l and *l*. In regard to *r* he says: "Die Zungenspitze steht beinahe gegen das Zahnfleish. Die dann durch die Enge getriebene Luft bringt den r-Laut hervor. Es scheint falsch zu sein, diesen Konsonanten als ein r, dem ein d vorklingt, zu bezeichnen." The last statement may be contested. The sound *r* was first written dj, then j, r, or dj, and until the last it continued to give the effect nearly of dr. Unfortunately it was recorded only in initial position, but there normally shows a definite occlusion. That in some cases the tracing of this occlusion is much rounded, indicating slurring of close stoppage of the breath, is a feature shared by this sound with all other stops, particularly b. Sonancy also begins at the usual point, namely a small fraction of a second after the beginning of the release. The duration of the occlusion varies from an eighth to a third of a second; the average is about a fifth, so that it is difficult to assign *r* to either the "t" or "d" type of stops. It is, however, true that tracings of *r* differ from those of other stops in that the line of the explosion does not immediately run into the vowel vibrations, but is followed by a gradual rise, or even a drop and a rise, which may contain three or four oscillations of the kind usually found in r tracings and due to flaps of the tongue. The sound may therefore be defined as an alveolar stop with a continuant release of more or less r quality.

This sound, in spite of its stop character, seems to be a development from original Malayo-Polynesian r: *r*i, bone, suri; *r*en,

water, rano (Madagascar, Motu), tanu (Rotuma), tun (Santa Maria).

The other r presents no anomalies except in initial position, when the "trill" vibrations which one should expect are normally absent. Instead there is a surd breath approach to the voicing, much as in the case of Marshall l. When intervocalic, r regularly shows three to four distinct voiced trills or flaps of the tongue; in the one set of records obtained of a word in which it is final, the flicks are regularly six in number and apparently surd, as the mouth tracings show no voice vibrations, and simultaneous glottal records happened not to be secured.

Summary

It is clear that the character of Marshall consonants is greatly affected by their position in the word. With the exception of l, and possibly *l*, r, and *r*, all final consonants are entirely surd, and even in these laterals and trills the voice fades away before the breath pressure and articulation cease. All medial, that is intervocalic, sounds are sonant. All initial consonants begin as surds, though as they approach the vowel they are invariably voiced. In the case of stops this means that the occlusion is surd, at least the last part of the explosion sonant; in the case of continuants, that there is some flow of breath before the voicing sets in. It is also clear that the nature of the consonants is determined by the following rather than the preceding vowels, that is to say that k leans upon a more in ka than in ak. This is shown by the fact that finals are entirely surd, initials partly sonant, medials entirely sonant.

In all essentials, these phonetic traits are duplicated in the Pima-Papago language of Arizona, and several individual features recur in a number of American languages; but, as regards the allied tongues of Malayo-Polynesian stock, the Marshall dialect seems to be phonetically greatly specialized.

Table of Sounds of the Marshall Language

Vowels (with h approach when initial): ·

Open: a

Open: ä, ô

Medium close: e, o
Medium close: i, u
Mixed, of indistinct quality: ŏ, ŭ
Semivowel: w

Consonants (x-, initial; -x, final; -x-, intervocalic):

	Labial	Dental	Alveolar	Post-alveolar	Lateral	Palatal
Long surd occlusion, sonant explosion		t-				k-
Short surd occlusion, sonant explosion sometimes fricative	b-	d-	*r-*	j-		g-
Fricative, usually sonant, no true occlusion	-b-	-d-, -t-		-j-		-g-, -k-
Surd occlusion, no release through mouth, possibly through nose	-b	-d, -t		-j		-k
Nasal continuant with mouth closure and gradual voicing	m-	n-				ñ-
Sonant nasal continuant with imperfect mouth closure	-m-	-n-				-ñ-
Surd nasal continuant with mouth closure	-m	-n				-ñ
Continuant, gradually voiced				r-	l-, *l-*	
Sonant continuant, 3–4 tongue trills				-r-		
Continuant, probably surd, 6 tongue trills				-r		
Sonant continuant					-l-, *-l-*	
Continuant, beginning sonant, ending surd					-l, *-l*	

-r and *-r-* occur but their character has not been determined

Explanations of Plates

The appended reproductions of tracings were simultaneously recorded from the throat and mouth (pls. XXV, XXVI), throat and nose or nose and mouth (pl. XXVI.1), and from the mouth alone (pl. XXVII). The vertical lines have been drawn to connect synchronous points in two tracings. In some cases, these also separate constituent sounds of the word; but their primary purpose is the indication, on the lower breath or nasal line, of the point corresponding to a change in sonancy, as

revealed in the throat line above. Such changes may or may not be equivalent to the transitions from one sound to another. It must also be observed that the vertical lines actually denote temporally coincident points in the two lines only when the lower tracing is near its base-level. As the mouth or nose line becomes considerably elevated owing to stronger breath pressure or impounding of the breath in the apparatus, the correspondence indicated by the vertical line is more and more lost, because the inscribing needle, being attached at one end, describes an arc instead of vertical strokes. In a high mouth or nose tracing, therefore, a point some distance to the right of the base of the vertical line corresponds in point of time to the point marked by the intersection of this vertical line with the upper or throat line.

Explanation of Plate XXV.

(Tracings from mouth below, from glottis above)

Fig. 1.—dil, louse nit. D with short occlusion, as in figure 2, as compared with the long occlusion of t in figures 3 and 4. L commences with a conspicuous dip, as in many American languages.

Fig. 2.—dol, mountain. L shows but a slight dip, as in European languages. As between this word and dil of the last figure, the l in the latter is regularly marked by a deeper dip in all the tracings obtained.

Fig. 3.—tō, rope. T with a long occlusion; beginning of sonancy marked by a drop in the glottal tracing—an American characteristic, unusual in Marshall.

Fig. 4.—tō, sugar cane (long open o). The inception of sonancy is of the normal Marshall type, to which figure 3 furnishes an exception.

With figures 1 to 4 compare figure 26.

Fig. 5.—ṛeb, a worm. *R* has a clear occlusion, but the release from this is followed by a fricative sound of some duration, which is first surd, then sonant, and shows one or two waves of r type.

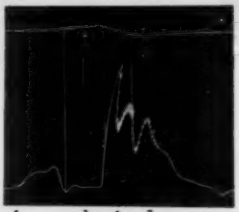
Fig. 6.—gōgō, a species of fish. Initial g of stop type, with short occlusion; medial g a voiced fricative.

Fig. 7.—gilgil, a species of fish. The first g is of normal initial type, with short occlusion. The unvoiced middle portion of the glottal line and simultaneous dip in the mouth line probably mark the surd end of the first l and beginning of the second g.

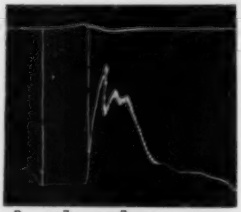
Fig. 8.—kŏrä, woman. K is of normal type, with heavy voicing at the end of its explosion. R shows three or four tongue movements, which appear even in the glottal tracing above.

Fig. 9.—marok, darkness. M becomes sonant very gradually, probably some time after closure of the lips; a shows a wavering in force of breath that is frequent in many languages in vowels preceding r or l; r has about four trills, and is less strongly voiced than either vowel; o reveals an increase in strength of sonancy toward the end that often appears immediately preceding a final surd stop, such as the following k, which does not show in the tracing.

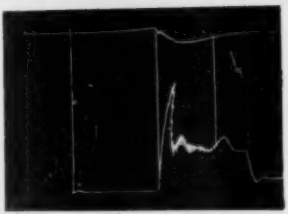
Fig. 10.—ṛuo, two. R begins surd, but quickly reaches maximum sonancy, whereupon its tracing runs into that of the vowels. The r is without tongue flaps. This trait is normal in initial position.



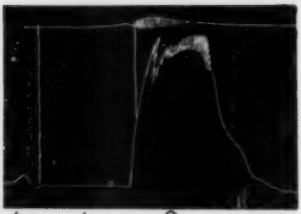
1. d i l



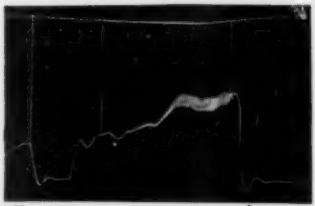
2. d o l



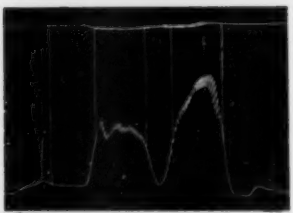
3. t ô



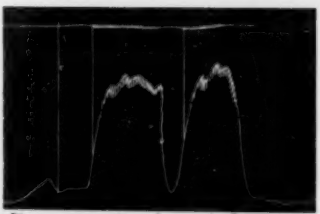
4. t ô



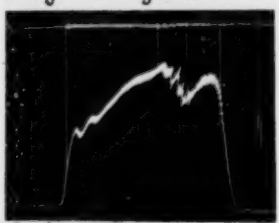
5. r e b



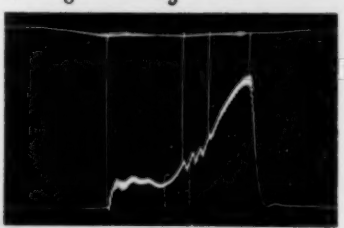
6. g ō g ō



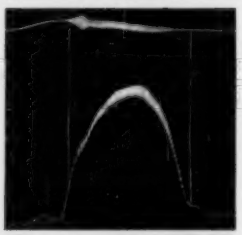
7. g i lg il



8. k ö r ä

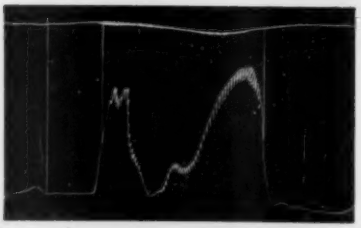


9. m a r o k



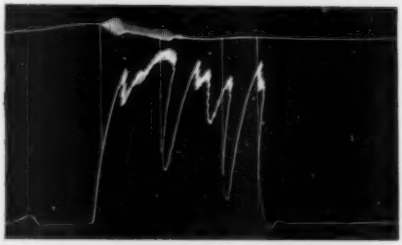
10. r uo

TRACINGS OF MARSHALL ISLAND WORDS

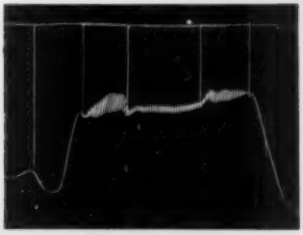


11. k e n ua m

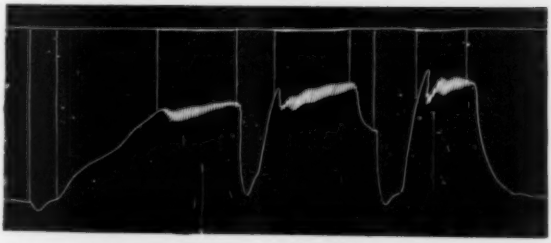
12. g a ñg ü ñ



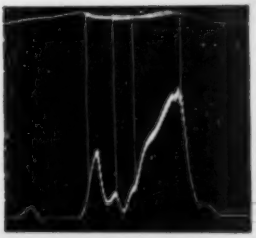
13 b ö d ökd ök



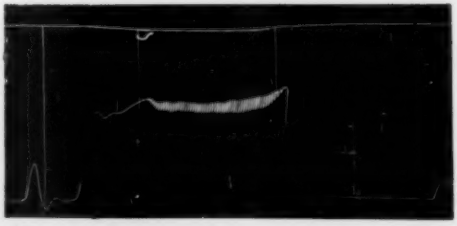
15. j i l u



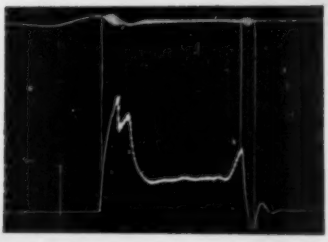
14. b ö d ö k d ö k



16. j i l u



17. b ā d



18. b ā d

TRACINGS OF MARSHALL ISLAND WORDS

Explanation of Plate XXVI.

(Tracings from mouth below, from glottis above)

Fig. 11.—kenuam, your neck. K of usual type, including heavy voicing of explosion; n is formed with imperfect tongue-teeth closure, as voice vibrations appear in the tracing from the mouth as well as from the throat; u and a can not be separated; m is voiceless.

Fig. 12.—gañgūñ, a species of fish. The second g, as it follows a consonant, is of initial, not medial, type; the ñ of the preceding syllable, being final, is surd and therefore coincides with the occlusion of this g.

Fig. 13.—bödökdök, blood. Probably bödögödök was actually spoken. The maximum strength of voice is reached during the last part of the explosion of the b. The three dips in the breath line, all sonant in the upper glottal line, represent intervocalic d, g, d. Final k does not show. Compare the following figure.

Fig. 14.—bödökdök, blood. B has only a vestige of an occlusion, but the place of its explosion is taken by a long surd fricative. Medial d is also, and exceptionally, surd; its definite explosion shows it to have been spoken as a stop of initial type rather than a fricative of the normal medial kind. K is not indicated other than by the short surd descent of the line from the conclusion of the second vowel, but this brief voiceless period suffices to allow the following d to be of regular initial stop type. Final k as usual is merely a surd closure and therefore does not show. The greater length of this tracing is due to unusually slow speech; evidently the informant was not only lengthening his vowels but syllabifying the word and speaking with greater distinctness of articulation than is normal.

Fig. 15.—jilu, three. The contour of the j is rounded, indicating some slurring of stop quality in the direction of fricative character. L in the breath line is depressed below the contiguous vowels, but without a sharp dip at the outset, and therefore of European rather than American Indian type. Compare figures 16 and 28.

Fig. 16.—jilu, three. J is of the usual stop type; l consists of a marked dip, due to momentarily decreased flow of breath; it is more heavily voiced than the adjacent vowels.

Fig. 17.—bād, smoke. B has a definite occlusion and release, but these are followed by a surd continuant. Pf was therefore probably spoken. The upcurve of the breath line at the extreme right may be the slight explosion caused by the release of the tongue from the teeth at the end of the d. Contrast the following figure.

Fig. 18.—bād, smoke. The maximum voicing occurs at the very end of b and at the end of ā or first beginning of d, which is otherwise surd.

Explanation of Plate XXVII.

(Tracings from the mouth)

Fig. 19.—bā or pā, hand. B has become a pure surd fricative, namely f.

Fig. 20.—*r*ī, bone. *R* here is a stop, but followed by a continuant release which soon becomes sonant and marked by a series of tongue flaps.

Fig. 21.—ôôr, beg (long open o). The first trill or two of the final r show indication of voicing; the others are surd.

Fig. 22.—lôjiöm, your belly (long open o). L shows much the character of *l* in figure 23; medial j and final m of usual type.

Fig. 23.—*löl*, rotten cocoanut. The short voiced elevation near the middle of the word probably represents the vowel. The preceding and succeeding l's then are both sonant in that part of their duration nearest the vowel, but surd farther away from it.

Fig. 24.—ɾaj, whale. R begins surd, becomes suddenly sonant, and at the very end is marked by one or two tongue flaps. The final stop as usual does not show.

Fig. 25.—ɾägä, stone. In this tracing ɾ is a continuant without trace of stop quality; like the r of figure 24, it begins surd and ends with a few voiced trills. G, as usual medially, is a voiced fricative.

Fig. 26.—From above down: dol, mountain; dil, louse nit; tô sugar cane (long open o); tô, rope. Illustrating the difference in length of occlusion for "d" and "t". Final l in both dol and dil changes from sonant to surd. Compare figures 1 to 4.

Explanation of Plate XXVIII.

(Figures 27 to 29, from Peter Luwilung: glottis above, nose below. Figures 30 to 34, from Hans Taramij: nose above, mouth below.)

Fig. 27.—juon, one. The affricative j shows a flow of air through the nose; this terminates at the moment of sonancy, i. e., with the mouth explosion. The naso-oral passage is therefore not tightly shut for the occlusion. Final n is surd.

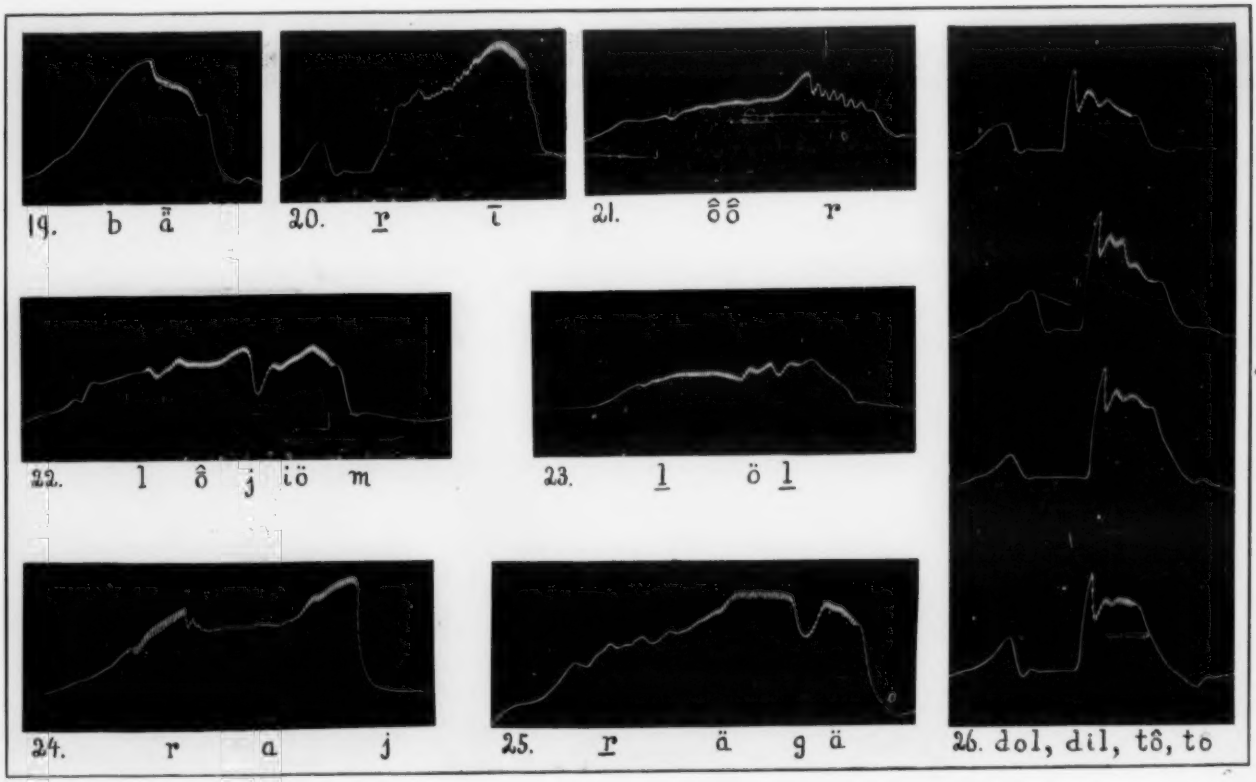
Fig. 28.—jilu, three. J is as in the last figure. The nose tracing for l is much higher than for the adjacent vowels, indicating that the naso-oral passage is more open for this sound, as probably for all consonants, than for vowels. The voicing of the vowels in this nasal tracing does not prove nasalization. Compare figures 15 and 16.

Fig. 29.—emen, four. There is a surd breath approach to the vowel, which also appears in most mouth tracings. Intervocalic m is sonant, final n surd except for light voicing in its first part.

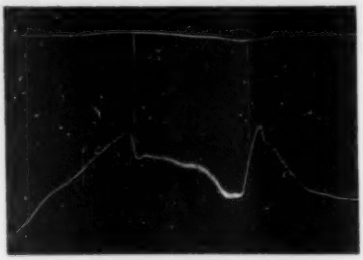
Fig. 30.—läñü, mouth. The gradual transition from surdness to sonancy in the initial l is clear both in the upper (nose) line and the lower (mouth) line. As in figure 28, more breath escapes through the nose for l than for the following vowel. Medial ñ is short and well voiced; the passage of air through the nose increases while diminishing through the mouth without being entirely checked; even the voice vibrations are recorded from the mouth, indicating imperfect closure by the tongue.

Fig. 31.—kenuam, your neck The typical tracing from the mouth for initial k is accompanied by a marked elevation in the nasal line, indicating that the air checked by the tongue finds its way out through the nose. Medial n has the same character as ñ in the last figure. Final surd m hardly shows even in the tracing from the nose. It is therefore very weak. Compare figure 11.

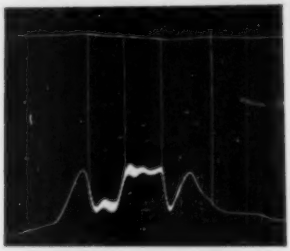
Fig. 32.—ɾen, water. Initial ɾ is much like ɾ of figure 20, but with fewer tongue movements. It probably continues to the highest point of the mouth tracing, when the vowel commences. The greatest elevation in the mouth record corresponds to the greatest depression in the tracing from the nose, as in most instances. The flow of breath through nose and mouth therefore tends to be in inverse ratio. The former preponderates in consonants, the latter in vowels.



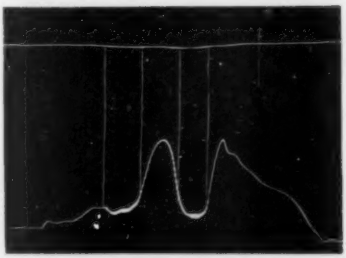
TRACINGS OF MARSHALL ISLAND WORDS



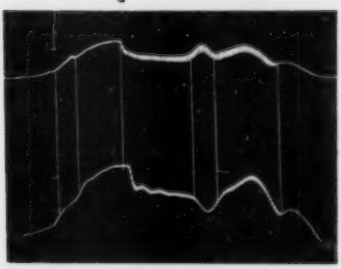
27. j uo n



28. j i l u



29. e m e n



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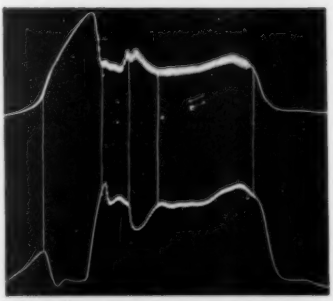

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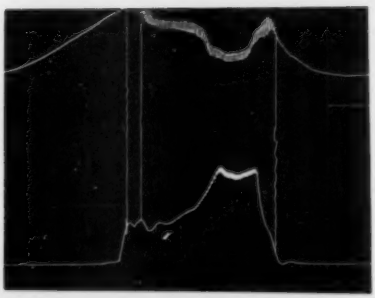

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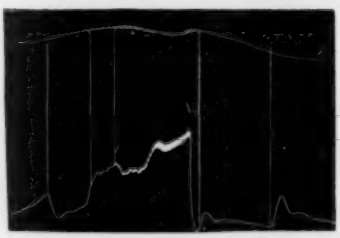

33. r e t

34. ā t

TRACINGS OF MARSHALL ISLAND WORDS

Fig. 33.—ɾet, sunshine. The occlusion of ɾ is fairly definite, but the explosion is less clear, the succeeding continuant element being distinct, particularly as regards tongue movements. These appear even in the nasal tracing, numbering about four flaps during surdness and five or six during the voiced part of the sound. Final t shows a definite though weak explosion from the mouth. The duration of the occlusion is a quarter second, or typical of the occlusion of initial t. The voice momentarily strengthens before it suspends for the occlusion.

Fig. 34.—āt, gall. There is a slight mouth flow of surd breath before the vowel properly begins. The t occlusion is sudden and complete for the mouth, but gradually attained in the nose. The release is wanting in the mouth, but shows definitely, though weakly, through the nose.

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PROFESSOR BOAS' NEW THEORY OF THE FORM OF THE HEAD—A CRITICAL CONTRIBUTION TO SCHOOL ANTHROPOLOGY

By PAUL R. RADOSAVLJEVICH

I. Introductory

LAST year a government document was published by the Immigration Commission in which an attempt was made to show that New York environment is bringing about "fundamental" changes in the physical type of immigrants. The author of this document is Professor Franz Boas[1] (1) of Columbia University.

Under his direction the heads of a large number of New York immigrants have recently been measured. These measurements include a study of: (1) the stature; (2) weight; (3) general physiological development of the individual; (4) two head measurements (length and width) and the corresponding cephalic index, indicating "the form of head"; (5) width of face; (6) color of hair, eyes, and skin. A majority of the individuals measured were school children.

The results of this investigation aroused much popular interest and considerable discussion in the daily press, and many popular magazines and semi-scientific journals repeated uncritically the several "unexpected" conclusions. It was widely believed that the results had dealt a death blow to the old theories regarding the stability of the form of the head, because they seemed to show that the form of the head is not a permanent characteristic of race as anthropologists had assumed; that the American environment rapidly affects the form of the head; that Jews are growing long-headed, and Sicilians short-headed, *i. e.*, that the cephalic index of the Jews is decreasing and that of the Sicilians increasing.

More especially on page 39 Boas concluded that

"on the whole, there has been a decrease in length of head, width of head, and width of face since the middle of the past century. . . . A feature that is particu-

[1] Numbers in parenthesis after authors' names or quotations refer to the numbers in the Bibliography at the end of this paper.

larly noticeable is the general drop of all the absolute measurements after the year 1894. An attempt to combine all the material, adult and children, for these years, brings out the sudden drop after 1893 even more clearly; and a similar phenomenon is repeated between the years 1907 and 1909. For this reason I am inclined to believe that the type of immigrants is directly affected by financial panics."

In another place (p. 28) Boas expresses the same conclusions in the following words:

"The type of immigrants changes from year to year, owing to a selection which is dependent upon the economic conditions of our country. This is shown by the fact that after the panic of 1893 a sudden decrease in the general development of immigrants may be observed, which persisted for several years. A similar change seems to have taken place after the panic of 1907."

How the "type" of immigrants was affected after the panic of 1893 is shown in Table III (p. 28) referring to the general deterioration in stature, length and width of head, width of face, and cephalic index (see Table VI of this study). According to these figures the panic of 1893 *decreased* stature, length and width of head, and width of face, but *increased* the cephalic index.

Does this increase and do these decreases affect the physical type of immigrants at all? Are the observed differences significant, and if so, are they due to the American environment and financial panics? Is there any scientific explanation of "far-reaching" changes in this new theory? Does it really mean a discovery in anthropological science that is of "fundamental" importance?

Before we enter into this large subject it is necessary to remind the reader of the older notions concerning the form of head, because it will help us in localizing various very important difficulties involved in the problem, and throw a new light on Boas' material and his explanation of it. Boas himself admits frankly that his "surprising and unexpected" results require "the most thoroughgoing criticism before being accepted as definitely established." We also believe that a healthy criticism will be beneficial.

II. Historical: On the Form of the Head

Until the appearance of this new theory, the historical answers to the question, "Does the form of the head change?" may be summarized in the following theories:

1. *The Mechanical-functional Theory*

According to this theory the shape of the head may be caused by the mechanical influences during the postnatal life. Thus the head-form may be modified individually by the kind of cradle in which baby sleeps. In his *Descent of Man*, Darwin says that the

"habitual spasm of the muscles, and a cicatrix from a severe burn, have permanently modified the facial bones. In young persons whose heads have become fixed either sidewise or backward, owing to disease, one of two eyes has changed its position, and the shape of skull has been altered apparently by the pressure of the brain in a new direction."(2)

He quotes Jarrold's *Anthropologia* (1880, pp. 115–6) in which are given the cases of modification of the skulls from the head being fixed in an unnatural position. Darwin says that Jarrold believed

"that in certain trades, such as that of a shoemaker, where the head is habitually held forward, the forehead becomes more rounded and prominent."(2)

In another place Darwin says that the skulls of many of our improved and domesticated species of animals have varied perceptibly; and he cites in addition pigs, diverse species of fowls, and rabbits. From his own observations on domestic rabbits he inferred that some kinds of skulls

"have become very much larger than in the wild animal, while others have retained nearly the same size, but in both cases the brain has been much reduced relatively to the size of the body. Now I was at first much surprised on finding that in all these rabbits the skull had become elongated or dolichocephalic; for instance, of two skulls of nearly equal breadth, the one from a large domestic kind, the former was 3.15 and the latter 4.3 inches in length."(3)

He also thinks that the tall men may be compared with the larger and longer-bodied rabbits, all of which have elongated skulls, or are dolichocephalic (2). And about fifty years ago, a German anthropologist, Welcker (4), found that short men more frequently have rounded heads and tall men elongated ones.

The mechanical-functional theory has been supported in quite recent times by a Stockholm anthropologist, Nyström (5), who believes that the form of head may change under the influence of diet. The osteologist Holden (6) claims that different habits develop different muscles, and that these muscles give rise to

modifications in the form of the bones as well as the bodily configuration. In short, function makes structure. He contrasts the skulls of the *Carnivora* with those of the *Ungulata* (or hoofed animals). His examples are the tiger and deer. He says:

"The skull of the tiger is in perfect adaptation to his enormous temporal muscle. It has a high median ridge, to which the muscles are attached, great arches of the zygoma, under which they pass, and broad and lofty coronoid processes, into which they are inserted. But his masseters are comparatively small, therefore the zygomata and the angles of the jaw are not specially strong. Now, the sole action of this temporal muscle is to clench the teeth together as on a hinge; so we find that his jaw articulation is hinge like, and allows no other motion. This mechanism is admirably fitted for cutting purposes, but is quite unfit for grinding; so his teeth are cutters. He has no grinders. Exactly the converse of all is true of the deer: his temporals are small; he has no median ridge, the passage under the zygoma is small, and his coronoid process is delicate and scarcely deserves notice. On the other hand, his masseters and pterygoid plates are greatly expanded, the angles of the jaw massive and extensive. The masseters acting with the internal pterygoids cause the grinding action; so here the articulation of the jaw is nearly flat, allowing of a free grinding movement; and in accordance with this, we find the teeth are flattened on the surface, and good grinders. It will be seen how clearly this conformation is in keeping with the habits and nature of each animal"(6).

And the slight differences between opposite sides of the same skull is explained by Holden on the basis of the law of Cuvier (7):

"That an invariable co-relation exists not only between the different parts of an animal's body, but likewise between the parts of his body and his mode of life."

Holden says that

"the posterior condyloid foramen of one side may be wanting, the mastoid process of one side may be larger than that of the other, or the digastric fossae may be of unequal size; one nasal passage may be larger than the other; the lateral sinus may be much deeper on the one side than on the other, or there may be a middle clinoid process on one side only. Asymmetry may occur in men highly gifted as in the celebrated French anatomist Bichat. This is no more than one might expect, seeing the difference often existing between features of the two sides of the same face. Such want of symmetry is greatly exaggerated in many of the lower animals, as may be seen in the Cetacea, in the head of the great sperm-whale, or in that of the narwhal. . . . But the most striking example of asymmetry is seen in those of flat-fish which lie usually on their left sides, viz., soles and plaice. . . . For in them both eyes are on the right or upper side of the skull, and one orbit only is completed, the eyes being directed away from the ground on which they lie. The teeth are chiefly developed on the left side of their jaws—

away from the side on which their eyes are—that is, on the white side. It is interesting to note that in those fish, when very young, the skulls are symmetrical. When the turbot is just hatched, it has an eye on each side of the head, and it is only by subsequent development that the asymmetry occurs. The turbot, unlike the sole and plaice, lies on its right side" (6).

Holden says, further, that the

"great and heavy skull of the crocodile contains large nasal passages and air-cavities which float it, so that its body can lie under the water while its eyes and nostrils alone appear just above the surface" (6).

In regard to the fact that some human heads are long, some broad, and others round, Holden claims that it is due to "the varying extent of growth of bone either in the transverse or the longitudinal sutures," or to "the early union of one or other of them." So in the case where the parietal bones unite very early,

"the skull was unable to accommodate the growing by increasing in breadth, and therefore, could only increase in length by growing at the fronto-parietal and the occipito-parietal sutures, thus giving rise to these extraordinary long skulls" (6).

Holden goes so far as to claim that "the history of the animal is always written on its bones," and that "low degraded types have skeletons which can not be mistaken, while the healthy, intelligent, and upright carry their characters in their skeletons as much as they do in their faces."

Müller (8) claims that there is a close relation between the form of head and the mechanismus of birth. He gives many illustrative examples from his own observations. Görke (9), Papillault (10), Haeckel (11), and others studied these mechanical influences in the light of functional shaping of skulls, based on the ontogeny and phylogeny of the human skull. In more recent times R. C. Osburn (12) studied the effects of the shape of skulls on the teeth of man. All these factors show the great complexity of the problem. (See especially Hrdlička, Eskimos, effects of temporal muscles on form of jaws and head.)

2. The Hereditary Theory

This theory is one of the oldest. But it has at least the following three forms:

a. The First Form of the Hereditary Theory.—According to this

theory *the shape of head is not changed*: it is one of the clearest of all permanent hereditary differences; it is relatively uninfluenced by climate, age, food, locality, and exercise. This theory is in one form or another advanced by Myers (13), Spitzka (14), Möbius (15), Rieger (16), G. Stanley Hall (17), Zupanchich (18), and other craniologists, archeologists, and so-called "anthropo-sociologists" (19).

So, for example, Myers found that the chief head measurements show approximately the same variability in the "prehistoric" people of Upper Egypt as in the modern population of the same region. A pupil of Prof. Martin (former director of the Anthropological Laboratory of the University of Zurich), Oetteking (20), came to the conclusion that the influence of Bushmen, Negroes, Libyans, and Hamito-Semites upon the Egyptian skulls can not yet be given exact craniometric expression. Keith (21), in his study of the remains of an ancient Briton, the Galley Hill man, was "struck" with the modernity of his form of skull, *i. e.*, the extreme length and extreme narrowness of his head, which is the "national" characteristic of modern Englishmen. Similar results are reached by a Croatian anthropologist, Gorjanovich (22). We might also mention the fact that the form of skull of a Scandinavian of the neolithic time is very similar to that of the modern Scandinavian. There are other cases of this kind.

From both Myers' and Keith's investigations one is led to conclude that age alone does not produce in a people increased heterogeneity. Keith says that the history of man in England does not begin some 5,000 years ago with an invasion of Celt or of Saxon, but at a period of which 5,000 years is but a small fraction. This theory has recently been advanced also by a Slovenian anthropologist, Zupanchich, in his lecture given last year at the University of Belgrade (Serbia) (23).

In short, the theory that the shape of the head is stable, hereditary and not fortuitous is the first form of the hereditary theory.

b. The Second Form of the Hereditary Theory.—This form of the hereditary theory holds that *the shape of the head is inherited, but that it does not assume its final shape until after birth*, and that it

does not depend on the mixed parental value of the cephalic index. O. Ranke (24), in his study of the form of the head of 4,607 German children (the age ranging from a new-born infant to a child of 15), concludes that the form of the head reaches its definite form relatively early, at seven, or even at six years of age. Sir W. Hamilton also says that in man the encephalos reaches its full size at about seven years of age (25). Vosilyev (26), who studied 936 boys and 264 girls between the ages of 7 and 16 years, belonging to the district of Szerpuchov, in the Government of Moscow, found that the form of head does not finally shape itself until after the sixteenth year. Pfitzner (27), who studied 3,660 cases in Elsace, also found that, apart from sex and age, the cephalic index seems to be the only absolutely fixed character for the determination and recognition of individuals.

Boas (28) in another study, in 48 families of eastern Jews, measured by Fishberg, states that one half of the children resembled the father in regard to the shape of head and the other half the mother. But the results of O. Ranke (29), based on head measurements of children of the same parents (51 families) do not substantiate Boas' conclusions. Ranke found a very striking resemblance in the form of head of all children of the same parents, regardless of the fact that the brothers and sisters were of different ages (ranging in age from 3 to 14 years), with two or three exceptions. Ranke's results agree with those of Thorndike (29*a*) who found that 35 pairs of twins of New York City showed a striking resemblance in cephalic index. Thorndike measured 50 pairs of twins from 9 to 15 years old; 58.5 per cent. of these school children showed brachycephaly, 37.1 per cent. mesocephaly, and 4.3 per cent. dolichocephaly.

Gray and Tocher (30) also found very little difference in the cephalic index of the racial elements of 14,561 pupils in east Aberdeenshire, England. Binet (31) in France, Tscherowskovsky (32) and Viasemsky (33) in Russia, and many others, came to almost the same conclusion (34). Matiegka (35), studying some 7,000 boys in the public schools of Prague, from 5½ to 14 years of age, found throughout those ages the same national, brachycephalic

type of the head. The measurements by two pupils of professors Meumann and Martin, Engelsperger and Ziegler (36), of 238 boys and 238 girls of the entering classes (average ages 6 years and 4.5 months) in the schools of Munich, show that the bulk of these pupils had the national form of the head—93.5 per cent. being brachycephalic and only 6.5 per cent. mesocephalic (not a single case of dolichocephaly). Schliz (37), studying 962 school children (from 12 to 14 years of age) in Heilborn, also found that the large majority of these children represent the brachycephalic type of head-form. The same is found by a pupil of Professor Martin, Teumin (38), who measured 100 female university students (mostly of Jewish race) in the Anthropological Laboratory of Zurich University The bulk of these students were brachycephalic—74 per cent.

Browne (39), who measured the students of Trinity College (from 1891 to 1898), found an average cephalic index of 72.5, which is the national type of the head of Englishmen. The same result was found by Venn (40), who measured 1000 students of Cambridge University (England). The majority of these students were mesocephalic—55.2 per cent.

In addition to these we may mention the study of a Polish author, Kraitschek (41), based on the measurements of 173 Jewish students of the State Gymnasium in Landskron (Galicia, Austria). He found not a single dolichocephalic student; only three were mesocephalic and the rest, 170 in number, were of a brachycephalic type (98 per cent.).

All these and many other studies show clearly that the youth represent the same type of head as the race to which they belong, with slight differences in degree, of course. This is the second form of the hereditary theory.

c. The Third Form of the Hereditary Theory.—This form of the hereditary theory claims that the *shape of head* (or rather skull) *is inherited*, but "heredity" means not absolute stability. Hrdlička (42), believes that heredity is subject to incidental irregularities as well as to gradual modifications. He thinks that the alterations in the skull

"need not be general or of prime importance, and may require for their d's-

covery detailed study and extended comparisons; but in the case of an individual from the earlier stages of the geological period immediately preceding the recent one they should as a rule be pronounced enough to be easily apprehended."

Hrdlička is very careful in using generalizations. He says:

"In the case of single features or with scanty material, all far-reaching conclusions must be avoided, for in such cases we can not be certain that we are outside of the territory of semipathological occurrences, and features of reversion, degeneration, or purely accidental variation limited to individuals or small numbers of persons."

Hrdlička's scientific sanity and exactness in measuring crania might be compared with the craniological work of Klaatsch (43), Kollmann (44), Martin (45), and other European experts in experimental physical anthropology.

3. *The Geographical-local Theory*

This theory is not unlike the preceding. It claims that the shape of the head is distributed more according to geographical localities than to nationalities. So, for example, the people of the Alps, no matter what language they may speak, show considerable similarities in type. Deniker (46), who analyzed and utilized all that has been published in different languages on the cephalometry and craniometry of European peoples (the total number of indices examined represent about 380,000 measured individuals or skulls), concludes that the cephalic indices are distributed over four groups of well defined areas, *viz.*, a dolichocephalic area, with mesocephalic *enclaves*, in the north of Europe; another more pronounced dolichocephalic area in the south of Europe; an area of strongly brachycephalic heads in the center of western Europe, and, finally, a sub-brachycephalic area in eastern Europe. A similar cephalic "world map," constructed from data on living men, and "sufficient in amount to eliminate the effects of chance," is given by W. Z. Ripley (47).

Beddoe (48), in studying 200 boys (16 and 17 years old) found that those belonging to the navy have larger heads than those of the reformatory and industrial schools. If anything, he says, their heads are slightly broader, but within the limits of error. He concludes that the differences in the form of head are connected with

the locality rather than with any other condition or characteristic. But Gray and Tocher, who measured about 15,000 school children from 93 schools, covering 30 parishes, in England, could not draw such a conclusion; they found only a very little difference in the cephalic indices of the racial elements, *i. e.*, something racial to heredity.

According to Ammon's (49) investigation the longheaded individuals are concentrated more in the city than in the country. In studying the recruits of Baden and "Gymnasialschüler" from Karlsruhe and Mannheim he found that the *urban class* (those whose fathers were of city birth, as well as themselves), the *semi-urban class* (those born in cities, but whose fathers were immigrants from the country), and the *semi-rural class* (those born in the country who had migrated to the city), as compared with those who remained in the country, show a regularly increasing dolichocephaly in each generation. He believes that the longheaded individuals are intelligent, or, as he calls them, "die Auserlesenen," the selected, because they have either the energy or the physical ability to seek their fortunes at a distance from their rural place of birth. This theory of cephalic superiority was accepted by many anthroposociologists (50). But others say that the percentage of dolichocephaly decreases with the progress of civilization. J. Ranke (51), who studied the "Reihengräber" of Bavaria, the skulls of Lindau, and the skulls of modern Bavaria, found a very regular decrease of dolichocephaly and an enormous increase of brachycephaly:

	Reihengräber of Bavaria	Lindau	Modern Bavaria
1. Dolichocephaly:	42	32	1
2. Mesocephaly:	44	36	16
3. Brachycephaly:	14	32	83

Weisbach (52) also found a brachycephalic index for the contemporary Austrian Germans. According to Livi (53) in northern Italy the professional classes are more dolichocephalic than the peasants, but in the south the reverse is the case. Topinard (54) says that the cephalic index

"varies in the human races from 71.40 in Greenlanders to 85.63 in Lapps, in the averages of the series; and from 62.62 in a New Caledonian to 92.77 in Slav

(Wend) in particular instances. The difference is greater if we include the distorted skulls. A scaphocephalus in the Laboratory of Anthropology has an index of 56.33, and a Peruvian skull of an Inca, one of 103."

Our intention is not to criticize here all these more or less different theories. All who are familiar with the sources of these investigations will agree that in many cases it is very hard to decide what are the reasons of very great differences in the form of the head. These differences appear to be due partly to the differences of race, but also, unfortunately, partly to the differences in the methods, and precision of measurements, and in the mathematical calculation. It is, therefore, almost impossible to tell in many cases whether a difference is due to inaccuracy or to variation of individuals. The past of craniological and cephalometrical studies moved along the horizontal rather than along the vertical line, a big collection of anthropological data being made without deeper explanation of it. President G. Stanley Hall is right in saying that there are so few problems in this field yet solved that the great number of cephalometric and craniometric measurements sometimes insisted on seem at present little more than affectation (*Adolescence*, vol. 1, p. 72).

Evidently further careful studies and investigations are necessary before any dogmatic statement can be made. Does Boas' new theory present a hope of reaching such a goal? Did he utilize elementary errors of previous investigators? Did he grasp the difficulties of their theories in shaping his own theory? Is his investigation a progress or regress in experimental physical anthropology in general and in school anthropometry in particular?

III. The New Theory in Relation to Results

We thought it would be in place to point out the main theories of the origin of the form of the head before we take up the theories of Boas, based on his study of immigrants and their descendants. His new views do not agree with any previous. He himself is opposed to the first, the mechanical theory. On page 51 of his report he says:

"It seems conceivable that the change in the length of the head might be due to the treatment of the infant. While the children born abroad are swathed, the

method of treatment in families living in America is entirely different. The swathed child lies on its back, and the continued pressure upon the occiput might bring about a slight shortening of the skull. All the data relating to correlation between width of head and length of head are opposed to this assumption."

He is not an enthusiast for the hereditary theory either, because, he says, the head changes may be inherited, and yet not necessarily reproduce the characters of the parents. He believes that it is quite possible that we can leave the problem of the head entirely out of consideration.

He also does not agree fully with the third main theory, the geographical-local theory. On page 32 of his report he says that no evidence has been collected which would show an actual change in type due to the direct influence of enviromment, because the type of immigrants changes from year to year, owing to a selection which is dependent upon the economic conditions of our country, "far-reaching" changes in "type" which "can not be ascribed to selection or mixture." According to Boas the racial characteristics do not survive under the new social and climatic environment of America. We may, therefore, call Boas' theory the *environmental-economic theory*, the first theory of its kind; *environmental*, because it claims that the descendants of the European immigrants change their type "*even in the first generation almost entirely*."

"Children born not more than a few years after the arrival of the immigrant parents in America develop in such a way that they differ *in type* (!) *essentially* from their foreign-born parents. These differences seem to develop during the earliest childhood and persist throughout life. It seems that every part of the body is influenced in this way, *and even the form of the head, which has always been considered as one of the most permanent hereditary features, undergoes considerable change.*"[1]

The theory may be called *economic*, because it claims that the panics of 1893 and 1907 caused a "sudden decrease in the *general* physical development of immigrants" and a "sudden" increase in the cephalic index.

But before accepting these unexpected scientific results unqualifiedly they should first be sifted by those who at least know the immense difficulties in attacking such complicated problems.

[1] Here, as throughout this study, the Italics are mine.

Therefore, this critical study. Our purpose is to follow step by step the scientific validity of Boas' results on the shape of the head and his interpretations of them. We will follow the order of his summary:

a. Boas' First Conclusion

"The head form which has always been considered as one of the most stable and permanent characteristics of human races, undergoes *far-reaching changes* due to the transfer of the races of Europe to American soil. *The East European Hebrew, who has a very round head, becomes more long-headed; the south Italian who in Italy has an exceedingly long head, becomes more short-headed;* so that both approach a uniform type in this country."

But what is the nature of these "far-reaching changes," and do they really affect "the type" of the form of the head? For the sake of concrete illustration let us compare Boas' results with those of Hoesch-Ernst (56), Hrdlička (55), Landsberger (57), Muffang (62), O. Ranke (58), Reuter (59), West (60), Windle (61), and the results of the study of the Edinburgh and Aberdeen school children (63). Table I gives this comparison.

Before attempting to make any comparison and draw any conclusion, let us clearly state that anthropological science discriminates few types of the head as indicated by the *cephalic index* (generally called the "cranial index," or "latitudinal index" or "index of breath," *in contrast* to two other altitudinal cephalic indices, *viz.*, the "vertical index" or "index of height" or the length-height cephalic index, and the breadth-height cephalic index). It is a ratio between the width (or breadth) of head and the length of the head. Say the width (W) is 142 mm. and the length (L) 180 mm. Then the cephalic index (x) is found as follows:

$$180 : 100 = 142 : x \quad \text{or} \quad x = \frac{142 \times 100}{182} = 78.$$

In short the formula of this index is: $x = \frac{W \times 100.}{L}$.

This method of determination of cephalic (or cranial) index was introduced by a Swedish anthropologist, Andreas Retzius (1742–1821) (64). By measuring the skulls he found two extreme indices: the *long* or dolichocephalic and the round, *broad*, or brachycephalic.

TABLE I

Ages	Boas				Hrdlička	Hoesch-Ernst	O. Ranke	Reuter	Landsberger	Edinburgh Report	Aberdeen Report	Muffang	Windle	West
	American-born Hebrews (3,000 cases)	Foreign-born Hebrews (2,941)	American-born Sicilians (402)	Foreign-born Sicilians (241)	New York Juvenile Asylum (1,000)	Zurich School Children (Switzerland): 350	School Children (Germany): 4,607	School Children (Germany): 373	School Children (Germany): 104	Edinburgh School Children (600)	Aberdeen School Children (600)	Liverpool Students (850)	Birmingham Pupils (148)	Worcester (Mass.) School Children (2,500)
Newborn	—	—	—	—	—	—	81.1	—	—	—	—	—	—	—
1 year.....	—	—	—	—	—	—	83.9	—	—	—	—	—	—	—
2 years.....	—	—	—	—	—	—	83.6	—	—	—	—	—	—	—
3 "	—	—	—	—	—	—	82.7	—	—	—	—	—	—	—
4 "	—	—	—	—	—	—	82.4	—	—	—	—	—	—	—
5 "	83.5	85.0	80.2	—	82.4	—	83.0	—	—	—	—	—	—	79.5
6 "	84.1	84.1	80.1	80.8	80.7	—	82.2	84.1	83.0			—	—	79.3
7 "	83.3	84.0	81.2	79.2	81.5	—	83.5	83.4	87.3	78.5	79.9	—	—	79.7
8 "	83.3	84.3	80.5	79.5	81.6	83.2	82.6	83.7	85.6			—	—	79.6
9 "	83.0	84.9	80.8	78.9	81.6	84.1	81.4	83.1	87.9			78	78	79.7
10 "	83.0	84.6	80.6	78.9	80.5	82.9	81.5	83.5	85.3	78.9	79.3	77	77	79.9
11 "	82.9	84.5	81.0	79.6	80.2	83.4	82.4	83.7	85.4			79	77	78.8
12 "	82.9	84.6	81.8	79.9	80.0	81.1	81.9	83.0	84.9			78	79	79.4
13 "	82.8	84.0	82.1	78.9	80.3	82.7	81.9	83.0	82.9	78.45	79.0	77	78	79.5
14 "	82.5	84.1	81.9	79.5	80.2	82.1	81.2	82.9	—			79	79	78.8
15 "	82.4	84.1	80.3	79.0	82.4	—	82.0	—	—			—	—	78.8
16 "	82.6	83.7	81.2	78.8	—	—	—	—	—	—	—	—	—	78.1
17 "	82.2	83.0	80.1	77.1	—	—	—	—	—	—	—	—	—	78.4
18 "	82.4	83.0	76.1	76.4	—	—	—	—	—	—	—	—	—	79.1
19 "	82.8	82.0	80.0	76.4	—	—	—	—	—	—	—	—	—	79.0
20 and over....	82.9	83.0	—	78.0	—	—	—	—	—	—	—	—	—	78.7

Later this number of types was increased to five. Today anthropological science discriminates three main types of the form of head as indicated by their indices:

(1) Long-headedness (or dolichocephaly)..... x — 74.99.
(2) Medium-headedness (or mesocephaly).....75 — 79.9.
(3) Broad-headedness (or brachycephaly).....80 — x.

This is the classification of Török (65), Reuter, Fishberg (66), and others. Let us now see what the above mentioned "far-reaching changes" mean.

If we compare Boas' average figures for American-born and foreign-born Hebrew boys and girls we see that at all ages both are of the *same type*—they all are broad-headed. And if we agree with those authors (Martin (67), Engelsperger and Ziegler, etc.), who classify broad-headedness into sub-brachycephaly (80–86.9) and hyper-brachycephaly (87–x) we shall find that both belong to the same division, sub-brachycephaly. Not one single year is represented by hyper-brachycephaly (except the Hebrew foreign-born girls whose average index is just 87, which is, according to O. Ranke's classification, also under sub-brachycephaly).

Or let us take the Sicilian boys. Boas concludes that the south Italian, who in Italy has an "*exceedingly* long head," becomes more "*short*-headed." But his average values show that not *one single* year measured is represented by exceeding long-headedness. The index of such long-headedness (technically called "hyper-dolichocephaly") is below 70 (according to Hoesch-Ernst's classification), and the figures for Sicilians show a minimum of 76, which represents a mesocephalic type of the form of head.

In short: *It appears that Prof. Boas' own figures or results do not prove his conclusions.* It may perhaps be contended that these figures are only averages. To this we may reply: *first*, that it is not customary to draw "entirely unexpected" conclusions from mere averages,—a method which has been condemned both in America and in Europe; *second*, if we take into account all individual subjects measured, we find that the number of medium-

headed is very small. Out of 3,090 American-born Hebrew boys and girls there are only 13 long-headed individuals (10 boys and 3 girls); out of 2,942 foreign-born Hebrew boys and girls there are 4 long-headed individuals (boys only). On the basis of Boas' tables presented in his appendix (Tables III, 5, *a*, *b;* Table IV, 4, *a*, *b*) we find that the bulk of both American-born and foreign-born Hebrew boys and girls belong to the same brachycephalic (or rather to the sub-brachycephalic) type at all ages represented. The only exception is the age of 17 in the case of American-born Hebrew girls, whose largest percentage belongs to mesocephaly (50 per cent.). The rest are distributed as follows: 36.4 per cent. brachycephaly, and 13.6 per cent. dolichocephaly.

If we compare the percentages of the whole, regardless of age, we have the following table:

TABLE II

	Dolichocephaly	Mesocephaly	Brachycephaly
I. Foreign-born Hebrew boys.....	4	12	84
II. Foreign-born Hebrew girls.....	2	12	86
III. American-born Hebrew boys.....	3	27	70
IV. American-born Hebrew girls.....	5	26	69

So far as these results go it can not be said that there is a real sex difference (a fact found also by Wissler (68) in his measurements of college students, Columbia University), and, therefore, we may combine these percentages under the two headings thus:

	FOREIGN-BORN HEBREWS	AMERICAN-BORN HEBREWS
Dolichocephaly:	3	4
Mesocephaly:	12	26
Brachycephaly:	85	70

The ratio of these types does not show any "far-reaching change," because it deals *with two distinct groups*, and does not affect the type—the bulk in both belonging to brachycephaly. The tables show that there is a difference of 1 per cent. in dolichocephaly, 14 per cent. in mesocephaly, and 15 per cent. in brachycephaly, but *it is not known what the differences were in the parents of these two groups.*

Again, Boas' theory is based not on percentile values but on averages, showing that there is not one single age represented either by long-headedness or medium-headedness. Boas' figure 1, representing the comparison of head forms of American-born and foreign-born Hebrews, has no bearing on his conclusion, that "the east European Hebrew, who has a very round head, becomes more long-headed" on American soil. The differences found by Boas, if they have any real meaning, may be regarded as the normal differences of separate groups, such as are frequently noticed in separate parts of the same people.

What is true of American-born and foreign-born Hebrew males and females is also true of the Sicilians born here and abroad. Table I does not prove Boas' conclusion that the south Italian, who in Italy has an "exceedingly long head," becomes more short-headed, because at all ages represented in this table there is not a single year represented either by "exceedingly" long-headed or by the lowest degree of dolichocephaly. The only conclusion we can draw from Boas' results of the cephalic indices of the American Sicilians is that the foreign-born American Sicilians, males and females, from 5 to 18 and over, are highly mesocephalic (cephalic index, 78–79), with the exception of the ages 5 (males, 80.8), 6 and 7 (females, 80.2; 80), the cephalic indices of which are very slightly broad-headed.

In regard to the American-born Sicilians, both males and females, we might conclude that the cephalic index is slightly above 82 only at the age of 12 (ceph. index, 82.1), in males, and at 6 and 16 years of age in females, whose cephalic indices are 81.2 and 85.0 respectively. The only striking difference affecting the type is shown at the age of 16 where the foreign-born Sicilian females are highly mesocephalic (78.4) and their American sisters of the same age are brachycephalic (85.0). This difference may, however, in the small number of cases, be entirely incidental. Boas also says that the adult American-born Italians are "few in numbers," but he does not state the exact number. Even in his appendix there is not a single table referring to Sicilians; and it is, therefore, impossi-

ble to see what the number of cases involved in every year tested, and what the individual distribution of cephalic indices is.

If we take Boas' results as they are, and compare them with those of other school anthropologists we shall see that both American-born and foreign-born Hebrews, males and females, are more or less sub-brachycephalic throughout the ages measured. These individuals agree with the subjects measured by Hoesch-Ernst, Hrdlička, Landsberger, O. Ranke, Reuter, and Teumin. In addition to that we may mention that the average figures of Matiegka Vosilyev, Schliz, Kraitschek, Engelsperger and Ziegler, and many others, agree with Boas' results in regard to the cephalic type of his Hebrew individuals. Schwerz (68*a*) measured recently 1,788 individuals in Kanton Schaffhausen, Switzerland, and found that all of them were more or less brachycephalic: 83.1 (at the age 6–7 years), 83.5 (7–8), 83.7 (8–9), 82.4 (9–10), 83.9 (10–11), 83.1 (11–12), 83.2 (12–13), 82.9 (13–14), 83.4 (14–16), 82.8 (16–17), 82.5 (17–18), 82.8 (18–19), 82.9 (19–20), 82.5 (over 20 years).

In regard to the American-born and foreign-born Sicilians Boas' average figures show that they are of mesocephalic type. Compared with the results of other authors mentioned in Table I we see that Boas' Sicilians agree with the type of the head form of West's subjects in America, and with that of pupils in Aberdeen, Edinburgh, Liverpool, and Birmingham (England). In addition we may mention that the high mesocephalic type was also found by Browne, Beddoe, Gray and Tocher (in England), and by Wissler and MacDonald (69) (in America).

Referring to his first conclusion Boas says:

> "This fact is one of the most suggestive ones discovered in our investigation, because it shows that not even those characteristics of a race which have proved to be most permanent in their old home remain the same under our new surroundings; and we are *compelled* to conclude that when these features of the body change, the whole bodily and mental make-up of the immigrants may change" (p. 8).

A short time ago a well-known New York magazine made a sarcastic reference to the old statement "You can not change human nature," based on Boas' conclusions.

b. Boas' Second Conclusion

"The influence of American environment upon the descendants of immigrants increases with the time that the immigrants have lived in this country before the birth of their children."

But this conclusion does not affect the type of the head form, at least. Here is Boas' table (p. 10):

TABLE III

	Cases	Cephalic Index	Average Age
Sicilian:			
Foreign-born boys 5 to 12 years old.....	241	79.5	9.6
American-born boys 5 to 19 years old:			
Born less than 10 years after arrival of mother	375	80.9	10.0
Born 10 years and more after arrival of mother	127	81.8	9.5
Hebrew:			
American-born boys 7 to 10 years old:			
Born 10 years and more after arrival of mother	290	82.3	9.2
Born less than 10 years after arrival of mother	257	82.4	9.2
Foreign-born boys 7 to 10 years old.....	179	84.6	9.1

This table shows clearly: (1) that all Hebrew boys (both those born less than 10 or those born more than 10 years after arrival of mother in America and those born in Europe) are of the same sub-brachycephalic type (not one of them is represented by the average hyper-brachycephaly!); (2) that all Sicilian boys are of the meso-cephalic type of rather high degree. The American-born and foreign-born Hebrew and Sicilian boys differ only in degree, which may be considered as something normal on account of the possible errors in measuring and calculations, and to the comparatively small number of cases, or, especially, as due to corresponding differences in the parents.

In this table Boas compares 5–12 years old foreign-born and 5–19 years old American-born Sicilian boys with the 7–10 years old Hebrew boys born in America and Europe. The range of age (and, of course, greater individual variation) in Sicilian boys is 14 years and in Hebrew boys—only 3 years. Again the average values for these American-born Sicilian and Hebrew boys does not correspond with Table III (p. 12). According to this table the average value for the American-born Sicilian boys 5–19 years old is 80.5, not 81.3 as is suggested by Boas' Table II (the average of 80.9 and 81.8). According to our calculation from Table III the average value for the American Hebrew boys 7–10 years old

is 82.7, not 82.3 as suggested by Boas' Table IV (the average of 82.3 and 82.4). According to our calculation from Table III the average value for the American-born Hebrew boys 7–10 years old is not 84.6 but 84.4. It is very interesting to note that Boas gives no tables presenting the individual distribution of cephalic indices of Sicilian and Hebrew boys born less than ten years, or ten years and more, after arrival of mother. All that he gives is the year of arrival of foreign-born Hebrew boys and girls, and the year of arrival of mothers of American-born Hebrew boys and girls (pp. 40–42) without any data in regard to their cephalic indices.

c. Boas' Third Conclusion

"The changes in head form which the European races undergo here consist in the increase of some measurements, in the decrease of others."

So, for example, Boas found that the length of the head is increased in American-born Hebrews and decreased in American-born Sicilians; the breadth of head is decreased in American-born Hebrews, but increased in American-born Sicilians.

But what is the nature of this decrease or increase? Table IV (see next page) will tell the whole story.

From this table we may figure out the increases and decreases, if foreign-born subjects are compared with those born in America. The average of maximum increase of the length in the Hebrews is 3.8 mm. at the age of 19 years; the average minimum increase for the same race is 0.8 mm. And here is an exception. At the age of 6 the foreign-born Hebrew boys excel their American-born brothers in the length of head by 0.6 mm. In regard to the Sicilian boys we see that the average maximum decrease of length of head is 7.6 mm. at the age of 18 years; the average minimum decrease is 2.1 mm. at the age of 5 years. At the age of 10 years both are on the same average level, and at the ages of 14 and 17 years the American-born Sicilian boys excel their foreign-born brothers by 0.5 mm. and 7.0 mm. respectively. And there are other irregularities:

The average maximum decrease in the breadth of head of the American-born Hebrew boys is 5.7 mm. (at the age of 18 years) and their average minimum decrease is 1.0 mm. (at the age of 13 years), with one exception at the age of 19 where there is an increase

TABLE IV

Age	Head Form of Foreign-born and American-born Hebrews						Head Form of Foreign-born and American-born Sicilians					
	Length of Head (mm.)		Width of Head (mm.)		Cephalic Index		Length of Head (mm.)		Width of Head (mm.)		Cephalic Index	
	Foreign Born	American Born	Foreign Born	American Born	Foreign Born	American Born	Foreign Born	American Born	Foreign Born	American Born	Foreign Born	American Born
4 years.....	—	—	—	—	—	—	—	171.8	—	137.7	—	80.2
5 "	169.9	171.9	144.3	142.7	85.0	83.0	176.5	174.4	142.5	139.7	80.8	80.1
6 "	171.8	171.2	144.3	144.0	84.1	84.1	177.7	173.5	140.5	141.1	79.2	81.2
7 "	173.3	174.4	145.3	144.9	84.0	83.1	179.3	176.8	142.4	142.9	79.5	80.5
8 "	174.9	175.7	147.2	145.7	84.3	83.0	179.5	177.0	141.7	143.1	78.9	80.8
9 "	175.5	177.8	148.8	146.3	84.9	82.3	181.7	179.2	143.3	144.5	78.9	80.6
10 "	176.3	178.2	149.1	146.9	84.6	82.5	180.3	180.3	144.3	146.4	79.6	81.0
11 "	178.0	179.7	150.3	147.9	84.5	82.3	182.0	179.1	145.0	146.5	79.9	81.8
12 "	178.1	180.6	150.6	148.6	84.6	82.3	183.7	179.6	144.9	147.2	79.9	82.1
13 "	179.3	182.0	150.6	149.6	84.0	82.3	184.0	179.8	146.2	146.7	79.5	81.9
14 "	180.9	183.5	151.9	150.3	84.1	82.0	183.9	184.4	146.2	147.2	79.0	80.3
15 "	182.9	185.1	153.7	151.3	84.1	81.7	186.7	183.5	147.2	149.0	78.8	81.2
16 "	183.1	186.0	153.2	151.6	83.7	81.5	189.8	183.6	146.2	147.0	77.1	80.1
17 "	183.6	186.9	153.5	150.9	83.0	80.9	191.3	198.0	145.9	150.5	76.4	76.0
18 "	186.6	187.4	154.5	148.8	83.0	79.6	192.4	194.8	148.4	155.8	76.0	80.0
19 "	185.1	188.8	153.5	154.7	82.9	82.0	189.9	—	148.1	—	78.0	—
20 and over....	187	188.8	155.4	153.7	83.0	81.4	—	—	—	—	—	—

of 1.2 mm. The average maximum increase of the width of head of American-born Sicilian boys is 7.4 mm. at the age of 18; the average minimum increase is 0.5 mm. (at the ages of 7 and 13); the exception to this rule is the age of 5 showing a decrease of 2.8 mm.

The fact is that there are exceptions in Boas' "fundamental" and "far-reaching" discovery. And we may ask, are these increases and decreases of two or three millimeters on the average due to "the American soil" and "financial panics" rather than to errors in measuring, calculating, and comparing results and differences in the parental stock?

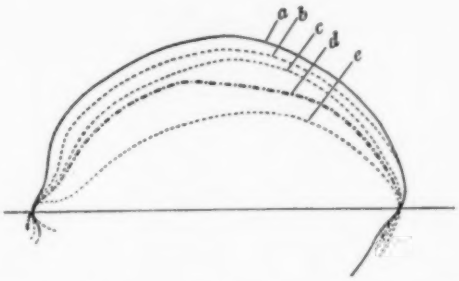

FIG. 55.—*a*, average European skull; *b*, Spy skull; *c*, Neanderthal skull; *d*, skull of *pithecanthropus*; *e*, skull of gorilla.

It is interesting to note here that all previous anthropologists found almost the same length of skull in the Europeans, Spy man, Neanderthal man, *pithecanthropus*, and gorilla. The difference of their skulls is shown in the height of the crania, as it is indicated in the accompanying figure (fig. 55) (after Wheeler: *Anthropology*, New York, 1909, p. 36; or Keane: *Ethnology*, Cambridge, University Press, 1901, p. 145).

There is no difference in the length and breadth of the head, but only in the height. Boas did not measure the height of the head. This third head dimension is of about the same difficulty in measuring as the other two head dimensions, the only difference being, perhaps, that the measurement of the height of the head

needs more time and trials until the required safety is reached. All modern anthropometricians measure the height of the head (Hoesch-Ernst, Engelsperger and Ziegler, Browne, Teumin, Reuter, Hrdlička, Martin, etc.). By means of this third head dimension could be figured out other, perhaps more important, cephalic indices and formulæ (*i. e.*, length-height cephalic index, breadth-height cephalic index, cephalic module, and cephalic capacity according to the formulæ of Venn-Galton, Schmidt, Pearson and Lee, or Hoesch-Ernst).

d. Boas' Fourth Conclusion

"The differences in type between the American-born descendants of the immigrant and the European-born immigrant develop in early childhood and persist throughout life. . . . The influence of American environment makes itself felt with increasing intensity, according to the time elapsed between the arrival of the mother and the birth of the child."

But a careful study of Boas' Table IV compels us to disagree with his conclusion that it "clearly shows the *strong* and *increasing* effect." This conclusion is of still less value if we apply it to the cephalic index. Let us study carefully his corresponding table giving the cephalic index of Hebrew males (p. 19) (see Table V opposite).

Are these differences in cephalic index of the total series and of foreign-born and American-born Hebrew males "the difference in type," and due to the "influence of American environment?" In other words is a *plus* or *minus* of 0.1 mm. and a *difference in type* due to the *American* soil? Besides this deviation from the average does not affect the type of the head form. Both foreign-born and American-born Hebrew males (regardless of the time of arrival of their mothers) fall within the brachycephalic type. In this connection I desire to call attention to what appears to me too great discrepancies in the numbers of cases recorded under different heads.

We find in the figures of the above table that one age is represented by 2 and the other by 223 cases (ages of 19 and 14 respectively). In the column three we see that the age of 6 is represented by 28 cases, but the corresponding tables of the length and breadth of head (pp. 17 and 18) have only 25 cases. The age

TABLE V

Age	Total Cephalic Index		Differences in Cephalic Index of Total Series and—					
			Foreign-born		American-born			
					Born less than 10 Years after Arrival of Mother		Born 10 Years after Arrival of Mother	
	mm.	cases	mm.	cases	mm.	cases	mm.	cases
5 years	83.5	71	+1.5	18	±0.0	29	−1.01	24
6 "	84.1	57	± 0.0	16	+0.4	28	−0.8	15
7 "	83.3	75	+ 0.7	18	+0.2	32	−0.7	25
8 "	83.3	98	+ 1.0	27	+0.2	45	−1.6	26
9 "	83.0	185	+ 1.7	51	−0.5	34	−1.0	100
10 "	83.0	359	+ 1.6	83	−0.4	137	−0.6	139
11 "	82.9	442	+ 1.6	114	−0.2	189	−1.1	139
12 "	82.9	521	+ 1.7	133	−0.2	225	−1.2	163
13 "	82.8	498	+ 1.2	137	−0.2	208	−0.9	153
14 "	82.5	477	+ 1.6	120	−0.2	223	−1.0	134
15 "	82.4	331	+ 1.7	94	−0.4	174	−1.6	63
16 "	82.6	73	+ 1.1	36	−0.8	23	−1.6	14
17 "	82.2	40	+ 0.8	24	−1.4	10	−1.2	6
18 "	82.4	27	+ 0.6	22	−0.7	3	−5.4	2
19 "	82.8	37	+ 0.1	31	+1.0	4	−4.3	2
20 and over...	82.9	803	+ 0.1	764	—	—	—	—

of 9 in the same column has 34 cases, but the corresponding tables show 61 cases each. The age of 10 in the same column has 137 cases, but the corresponding tables show 140 and 141 cases respectively. The age of 11 in the same column shows 189 cases but the corresponding tables show only 184 cases each. The age of 14 in the same column shows 223 cases but in the corresponding tables there are only 215 and 184 cases respectively. The age of 15 in the same column has 174 cases, and the corresponding tables only 154 and 126 respectively.

Again the age of 6 in the fourth column shows 15 cases and the corresponding tables 16 each; the age of 9 shows 100 cases, but the corresponding tables only 82; the age of 10 has 139 cases and the corresponding tables have 136 and 137 respectively; the age of 11 shows 139 cases, and the corresponding tables 144 each; the age of 14 has 134 cases and the corresponding tables 142 each; finally the age of 15 in the same column shows 63 cases and the corresponding tables 83 cases each.

The same table shows 803 cases at the age of "20 years and over" (first column), but the corresponding tables show 802 cases each; the second column of the same table shows 764 cases for the age of "20 and over," and the corresponding tables have 736 cases each.

It may be contended that all these errors do not materially affect the conclusions. We do not know. But we believe that these

and other methodological errors may be just the cause of the differences, and not the American soil and financial panics. Even by those minute deviations from the average it can not be certainly inferred that the greater variation of the figures means that the Hebrew or Sicilian is undergoing a modification of the shape of the head on American soil.

e. Boas' Fifth Conclusion

"The type of the immigrant changes from year to year, owing to a selection which is dependent upon the economic conditions of our country. This is shown by the fact that after the panic of 1893 a SUDDEN *decrease in the general development of immigrants may be observed, which persisted for several years. A similar change seems to have taken place after the panic of 1907."*

Here is Boas' table, referring to foreign-born Hebrews, men and women (p. 28):

TABLE VI

Period of Arrival	Stature	Length of Head	Width of Head	Cephalic Index	Width of Face
	cm.	mm.	mm.		mm.
1880	−0.5	+1.7	+1.5	+0.1	+3.5
1880–1884	−0.8	+0.2	+0.7	+0.0	+1.6
1885–1889	+0.5	+1.2	+0.3	−0.4	+0.4
1890–1894	+0.1	+1.6	+0.4	−0.5	+0.2
1895–1899	−0.9	−1.2	−0.3	+0.3	−0.4
1900–1904	+0.7	−0.9	−0.4	+0.2	−0.7
1905–1909	±0.0	−0.3	+0.1	+0.1	−1.2

This table does not warrant such a broad conclusion it seems to me, and especially in regard to the head form as indicated by the cephalic index, because it is of the same sub-brachycephalic type, before and after the panic of 1893. The slight increase (0.3) of the cephalic index after 1893 is so small that we may with confidence say that it is due to something else than the financial panic. Even the absolute measurements of the length and breadth of head show such small differences that they can hardly be ascribed to it.

These differences are of no typical character or fundamental significance. The same may be said of Boas' differences in cephalic index between American-born and foreign-born Hebrew children and their own parents (see his Tables XVI and XVII). It is a fact

that all Jews, from Roumania, Galicia, Little and White Russia, Poland, Lithuania (according to Boas' Table XII), including the foreign-born and American-born Hebrew boys and girls, and their parents, are more or less sub-brachycephalic. Even the differences which Boas found between parents and their children are normal differences in degree, which may be the result of the countless errors in such delicate measurements, and other causes.

IV. Critical Remarks on Dr Boas' Methodology.

Regarding the methodology the following criticisms are to be made:

1. The prime condition in reporting cephalometric results is to give the *modus operandi*, to state exactly what is meant by antero-posterior and transversal head diameter. All that the author says about those two diameters is that the transversal diameter is the "width of the head," and that the second diameter ("or the length of the head") is measured from the forehead to the back of the head. But the "forehead" has at least three anthropometrical points—glabella, ophryon, and metopion. Perhaps the point most generally adopted was used, namely the point on the glabella, the space between the eye-brows, but it is not stated. Many anthropometricians (for example, Bertillon (70)) use the point situated on the root of the nose. And then, is "the back of the head" the inion, or the highest point on the occiput? Boas fails to state. Is the width of the head the maximum width of head taken above the ears wherever found? He also fails to inform us whether he followed the *Frankfurter Verständigung* (71), or the *International Commission Anthropomètrique* (72) or some of the English systems (Cambridge or Dublin Anthropometrical Systems), for example the method given in the "Report of the Anthropometric Committee of the British Association" (London, 1910).

2. *Boas did not make all these measurements himself.* What assurance have we that his staff of thirteen anthropometrical amateurs exactly understood and applied with uniformity what was meant by the length and width of head? On page 36 of his report Boas gives a table of the measurements of his observers, and concludes

that the measurements are "quite comparable." We should like to enquire, however, whether those figures are averages of their "training" taken on the first and fourth Saturdays in May, 1909, the averages of the second Saturday of their practice, or the values of the first or last of their trials. This very important feature is not explained, and it is difficult to understand what the purpose was in giving the table. But, suppose these figures are the values of the final trial; then it is difficult to imagine what the rule is in such delicate practice for original research work. Bertillon, Martin, and other anthropometricians require from their students an exactness for the length and breadth of the head within the limit of about 1 mm. If the difference is as much as 2 it is regarded as a discrepancy beyond which measurements cease to make identification of the subject measured possible; and, if it is over 2, mistakes of a serious character are made beyond which non-identity can be made. The personal equation of Boas' thirteen observers who made successive measurements by way of preliminary practice on each other is in every observer above 0.5 mm. Now, if these figures represent the final test trial of those observers, then we can not understand how they can be qualified to take up such a delicate piece of research work. It is not stated how many times a subject was measured. Perhaps each subject was measured ten times. There would be probably ten signalments, differing by very small quantities. These differences can be, of course, ignored until they reach a certain point after which they destroy the value of the measurements. Have Boas' observers reached this point? Again, if this point is reached during the practice when each observer's measurements are controlled by their master, what personal equation can we expect from their main measurements of school children and adults! Boas, indeed, says that in the case of school children a "considerable number of control measurements were made," but he gives no details.

We have to keep in mind the fact that the method in the collecting of his data is not *individualistic* but *collective* ("generalized," *en masse*) in nature. This means Boas did not study the effect of "American soil" and "financial panics" on the *same* individuals during a period

of time representing the age of his subjects (4–20 years "and over") but he collected this data in a very short period, measuring a large number of immigrants. Why is it not possible that all the supposed "facts" thus brought to light may be quite spurious, owing to the great individual differences which may and do exist in the subject? Just on account of these individual differences it may be that the variations within a group of a given age are such as to completely obliterate all the actual peculiarities of the curve of growth. This difficulty is not touched upon in his theory.

4. Another difficulty with this theory is that *big conclusions are drawn from comparatively few measurements.* We are told that the measurements include about 30,000 individuals, but in the report are given only the results of measurements on (1) 6,032 foreign-born and American-born Hebrew boys and girls (Tables III and IV, in Appendix of Boas' report), 730 foreign-born adult Hebrew males, according to place of birth (Table I, Appendix), together 6,752 Hebrews; (2) 743 Sicilian boys (both born in Italy and America) but the number of American-born and foreign-born girls is not given. In regard to the adult American-born Italians, Boas says that they are "few in numbers." We are surprised indeed that he has not a single table in his appendix referring to Sicilians, yet throughout his report he comes again and again to his discovery that very short-headed Jews are becoming "long-headed" and very "long-headed" Sicilians "short-headed." Instead of these tables, he gives tables occupying 11 full pages, relating to his old study of the stature of Toronto children, and having no connection at all with his study of the descendants of immigrants. Again, from those tables given in the Appendix it is very hard to fix the exact number of Hebrews. According to Table I, Appendix, giving the types of foreign-born adult Hebrew males in regard to the place of birth, Table III, giving the cephalic indices of foreign-born boys, and Table IV, showing the cephalic index of foreign-born girls, the whole number of Hebrew immigrants is 3,672. But from Table II (also in Appendix, pp. 60, 64) we see that there are 1,527 "types of foreign-born Hebrews immigrating at different periods." Where are the rest of the 2,145 foreign-born Hebrews?

The distribution of individuals according to place of birth, different periods of immigration, and ages does not seem to be an ideal one.

As, for example, Hebrews from Lithuania represented by 82 cases and those from White Russia by 163. Or, the Hebrews immigrating during the period between 1900 and 1904 are represented by 214, and before 1880 by only 22 cases. Or, the cephalic index for foreign-born at the age of "20 and over" is based on 764 cases, and at the age of 6 there are only 6 cases. The American-born Hebrew boys at the age of 12 are represented by 388 cases, at the age of 18 by 5, and at the ages of 4 and 19 by 6 cases only.

In regard to the cephalic index of the foreign-born Hebrew girls the age of "18 and over" is represented by 895 cases, and the age of 4 by one single girl only. Of American-born girls, the age of "18 and over" is represented by 65 and the age of 4 by 6 cases.

Now, with such a very uneven distribution of cases it is impossible to accept the given explanation of his results. The even distribution of pupils is not an unimportant scientific requirement. The modern anthropological investigations of the pupils of Meumann and Martin (Engelsperger and Ziegler, Hoesch-Ernst), Reuter, Edinburgh and Aberdeen school anthropometric investigations, etc., had the same number of each year and sex. Even Quetelet (73) used this principle in his measurements in his day.

In looking over the tables dealing with the Hebrew subjects we have found a few more errors, which ought not to be found in the work of an expert biometrican of high rank, whose investigations are carried out by a "small army of serious, scholarly-looking young men" and generously supported by the Immigration Commission.

So, for example, the first table on page 60 of Boas' report shows that there are 214 cases of cephalic indices at the period of 1900–1904 and the two corresponding tables of the length and breadth of head show only 213 cases each. The first table on page 64 shows 162 cases of cephalic index in the period of 1890–1894, but corresponding tables show 161 and 163 cases respectively. On page 68 the average of the length of head of 18 foreign-born Hebrew boys is given as 169.9 instead of 169.4.

The first table on page 72 shows 764 cases of cephalic index at the age of "20 and over," but the corresponding tables show only 763 cases. On page 82 there are 24 cases of cephalic index at the age of 14, but the corresponding tables show 24 and 23 cases respectively. On the same page (second table) there are 65 cases at the age of "18 and over," and the corresponding tables show 66 and 67

cases respectively. On page 90 there are 100 cases at the age of 9, but the corresponding tables show only 82 cases. On the same page there are 139 cases at the age of 10, but the corresponding tables show 137 and 136 cases respectively. The age of 11 is represented by 139 cases, but the corresponding tables show 144 cases each. The age of 14 is represented by 134 cases, and the corresponding tables show 142 cases each. The age of 15 years shows 63 cases, but the corresponding tables show 20 cases more. The ages of 18 and 19 are represented by 2 cases each, but the corresponding tables of the length and width of head show not one single case.

5. Another difficulty in the way of accepting Boas' theory is the fact that *his statements in regard to the methods of his other records and measurements are not as complete as they should be.* So, for example, he does not say what he means by the figures representing the age of his subjects. Do they represent the "last birthday" or the "nearest birthday" or, perhaps, something else? The same ambiguity we find when we want to know what is meant, by the "general physiological development of the individual," "stature," "weight," "width of face." All that he says about "general physical development" is that observations were made on pubescence as a means of determining the approximate physiological development." However, he mentions that the "method of these observations has been developed by Dr C. Ward Crampton, but it is available only for the short period of adolescence." The question is now, was the same, or similar, or a different method used from that of Crampton and what is this method? Again, he says that in "those New York schools in which bathrooms are established it was possible to obtain the weight of children without clothing." But how about other schools and individuals investigated? We also fail to see the precise method in measuring the stature of body. Did the subjects stand in the upright position *with* or *without* shoes?

Again, what is meant by the distance "between the zygomatic arches"? This measurement is subject to great errors if the method of taking is not exactly stated, especially in measuring the living. Is it not possible that the "surprising and unexpected changes" in width of the face and other measurements are due to inexact statements and consequent inaccurate measurements?

A similar difficulty confronts us in regard to the instruments used.

On page 33 of his report we are told that the "color of hair, eyes and skin" was studied. On page 37 we are told that "a standard of hair-colors made by Messrs. B. Dickson & Co., of New York" used. But this "standard" is not described. Is this standard something new in principle and structure, or is it superior for example to the "Haarfarbentafel" of Fischer? Is there any scientific reason for preferring to use "no samples of eye-colors" instead of Martin's eye-colors (which, according to Boas, were "not as successful as might have been desired"), or Bertillon's chart of the colors of the human iris? Preference seems to have been given to guess-measurements of the eyes by young men of little experience over the best scientific means in that matter, "on account of the great expense involved in the purchase of a sufficient number of sets" (the "Augenfarbentafel" of Prof. Martin costs about $16). Nor were the "standards" for the determination of the skin-color used.

On page 34 of his report Boas says that he copied the full records which have been kept in the Newark Academy for many years. He gives a blank used for recording the measurements in this school but he does not state *how many* pupils were measured, *who* measured them, *what* was the method in measuring the "stature," "weight," "grip," "color of eyes," "hair," "skin," "length of head," "width of head," and "width of face." Again Boas says that he used this record for the sake of studying the "American families settled in this country for several generations and living under more favorable conditions." Do results of his report include the results of these records? If these records refer to the American-born Hebrew and Sicilian boys, from what tables can we see this fact? Did he treat the results of his staff together with these strange records?

On page 34 of his report Boas says that "in the schools it was necessary to obtain statistical information from the parents." He gives a blank for collecting this information but he does not state who filled out those blanks—the members of his staff, teachers, parents, or children. As the blank includes the following headings:

"I . . . came to America . . . years ago; in the year . . . My father came to America . . . My mother came to America . . . Father's father . . . Father's mother . . . Mother's father . . . Mother's mother came to America . . .," there is room for the suspicion that these blanks were filled in by children.

6. Another difficulty in Boas' theory of the head form is that *he explains it by the use of means to which, I claim, he is not entitled.* On page 11 of his report he gives three sketches of head form which are reproduced in the accompanying figure (fig. 56).

In the upper row there is "the more rounded" head form of the foreign-born Hebrew (1), and "the more elongated" head form of the Sicilian (2). Below these two there is a form of the head of the descendants of the Hebrews and Sicilians born more than 10 years after the arrival of their mothers (3). Careful study of these three

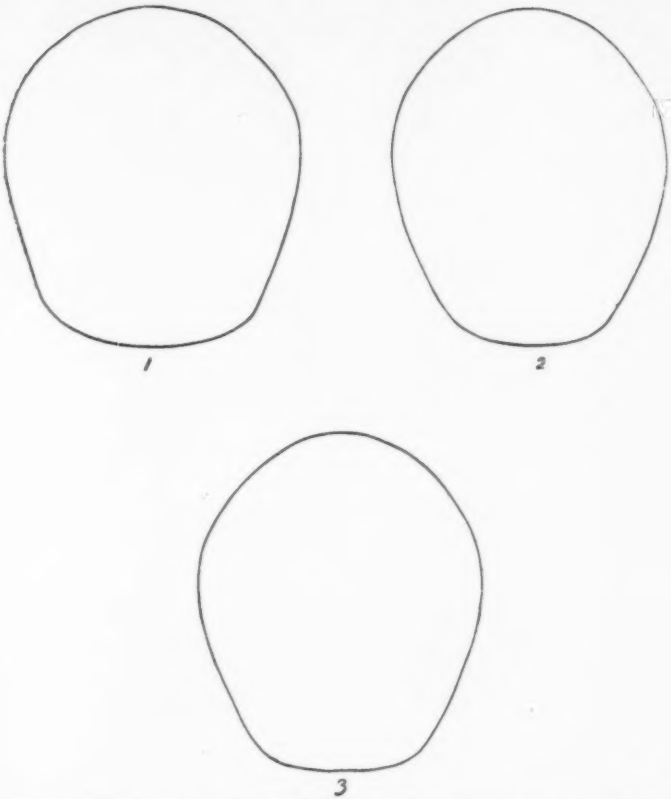

FIG. 56.—Slightly reduced from Immigration Commission Rep., Senate Doc. No. 208.

sketches will show that their cephalic indices are of the same type; all three represent brachycephaly, since the length of each of the three (original) sketches is almost the same (56 mm.), and the width 49, 46, and 46 mm. respectively. The corresponding indices of these sketches is above 82, representing the same type of head form. The slight difference is one of degree only; and, if we take into account the possible errors in such delicate head measurements, and especially if we have in mind the difficulties above mentioned, we may be

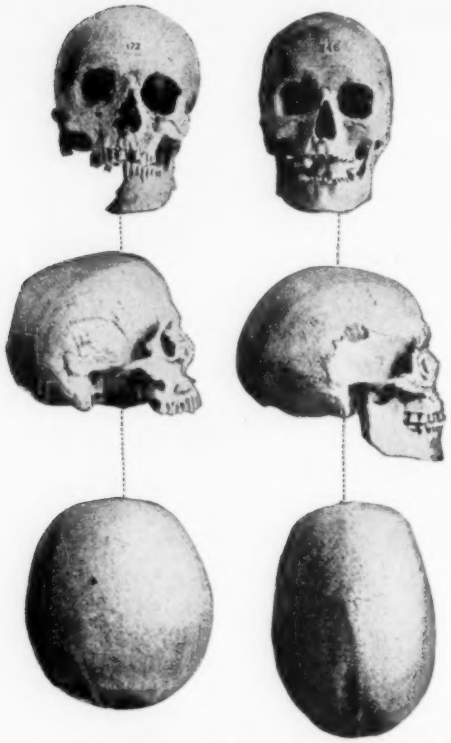

FIG. 57.—Upper, front, and side views of skulls of the Long and Round Barrow Races, photographed by A. C. Haddon from specimens in the Cambridge Anatomical Museum. On right, Long Barrow, Dinnington, Rotherham. Length, 204; breadth, 143; cran. index, 70.1; male. On left, skull of a man of the Round Barrow Race, from a secondary interment, two feet below the surface, in a *long barrow*, Winterbourne Stoke. Length, 177; breadth, 156; cran. index, 88.1. (Reproduced from Haddon's *The Study of Man* by courtesy of G. P. Putnam's Sons, New York.)

justified in doubting whether these differences are due to the effect of "financial panics" or "American soil."

But these sketches were made so that they give an impression of "more rounded" and "more elongated." This impression is not due to the mere ratio between length and width of head but

to the shape of head *as viewed from above*. And then, in his plan of investigation he did not use this, Sergi's "natural system" of classification of the shape of head. He did not even measure either the total horizontal circumference, or the forehead (the smallest width of forehead), or any other part of the head form, except the length and width of the head. These sketches of head forms are, therefore, based not on his measurements but on pure imagination. According to Sergi's natural classification, the head form may be "ellipsoides," "ovoides," "pentagonoides," "sphenoides," etc. (74) but not "more rounded" or "more elongated." To show the reader what a "more elongated" and "more rounded" skull really means, we will use the accompanying figure from Haddon (75) (fig. 57). In Boas' sketches there are no "more elongated" head forms but all of them are of the same brachycephalic type, more or less broad. There is no reference either to Sergi's demonstration that a head which, according to the measurements of the cephalic index ought to be of dolichocephalic type, might be of brachycephalic type and *vice versa*, or to Manouvrier's (76) theory that the variations of the cephalic indices are the most insignificant physiologically.

7. Attention must also be called to Professor Boas' *citation of authors*. He has apparently overlooked almost all the new anthropometrical movements outside of America, and it would seem from his references that his reading here has been uniquely restricted. He mentions the names of few authors (Gould, Baxter, H. P. Bowditch, C. W. Crampton, M. Fishberg), and gives only one reference (p. 38). This quotation is of such a nature that we can not see any special scientific reason for quoting one authority and not the works of other authors mentioned also.

Further, on page 46 Professor Boas says:

> "In all races of man the head becomes slightly longer with increasing age, so that a young son is always more round-headed than his father."

He does not state who discovered that fact nor does he give any references. He states this result in a categorical manner. But the fact is that authorities do not agree on this point and dogmatic assertion is misleading. So, for example, Weissenberg (77), who

studied Russian Jewish children *en masse*, found the following indices: 86.4 (for 3 newborn children), 84.7 (for 4 five year old children), 84.0 (for 25 ten year old), and 82.5 (for 100 "grown" children). But such regular decreases were not proven by any other author. And then the number of Weissenberg's cases is too small to draw any general conclusions from, especially if we take into account that he did not measure the same children from year to year. Landsberger, who measured the same children yearly (from 1880–1886) found an average yearly *increase* of 1.0 in cephalic index. Lucae (78), who studied 20 boys from their third to their fourteenth year, found a slight decrease of cephalic indices in 16 boys; in one case the cephalic index was the same from six to ten years of age, and in three cases there was an increase from year to year. O. Ranke, who studied a large number of children, could not establish Weissenberg's results. Lecourtois (79) and Bonnifay (80) agree with Ranke. Lecourtois, on the basis of his own measurements, claims that the cephalic index of a newborn infant remains constant throughout life. Bonnifay found rather a slight increase of the cephalic index with age. Gray (63) in his Aberdeen report remarks that the cephalic index was less in the older than the younger girls, but in boys it was the same at all ages tested between six and fifteen years.

The comparison of the results of our Table I will show clearly that Weissenberg's regularity of decrease in the degrees of cephalic index (not in cephalic type!) is not proven. And even the supposed "general irregularity" of West and others is of doubtful scientific value, because these "general regular increases" may be due not to age or any "law" of the cephalic periodicity (similar to the periodicity in the body growth) but to countless mistakes and errors in measurements, comparisons, and mathematical calculations. Some biometricians and experimental psychologists make a fetish of figures. Mathematical calculations in anthropometry and experimental psychology, as also in experimental pedagogy, are of fictitious value if we do not know exactly the nature of their *modus operandi* and the exact value of their "units."

All that we can say from these "general regularities" is that the

type of the head form is not materially affected by age; it is always either brachycephalic or mesocephalic. That these differences may be due to methodological mistakes and personal equations was proven by Binet (31), who measured the same pupils with the same instruments on several days, and found differences in results. He also compared his results with those of three well-known French anthropometricians, Manouvrier, Deniker, and Lapique, who used the same instruments (compass-glissière à triple graduation), and measured the same pupils on the same day, and found that the results did not agree. Gray (63) found that the measurement with Hepburn's callipers was uniformly greater than the measurements with Hay's instrument. All these facts are only an additional reason why the cephalic measurements must be taken not once or twice in succession, but five, ten, or even more times, until the difference required of these measurements is limited to about 0.5 to 1 mm.

Yes, the two common head measurements (length and breadth) are not in themselves difficult, but they require a good deal of attention, patience, and perseverance. Anthropometrical and cephalometric work is like all other work: the more attention is paid to its details, the better results it yields.

V. General Summary

To summarize then, the main objections to the new theory of Boas are:

1. *That his theory of the head form does not agree with his actual results.* From his tables we see that all Hebrews (born in America and in different countries of Europe) are of the same sub-brachycephalic type. Not one age, not one sex, not one individual of Hebrew nativity is represented either by dolichocephalic or by mesocephalic type. The same is true in its way of the Sicilians measured. They are of a high mesocephalic type, both in America and in Europe.

2. *That the normal differences in degree of these two types are probably not due to the "American soil" or "financial panics,"* as Boas maintains, *but to the countless methodological, technical, and mathematical difficulties which we have shown.* It is a well known fact that even

specialists, experienced in technical methods of measurement, can make serious mistakes in measuring the same head, if they have not taken the precaution to harmonize their methods at the beginning, while Boas' results are based not on his own measurements but on those of thirteen amateurs. It is also interesting in this connection to note Boas' own statement, that the work of his staff "had to be pushed with considerable energy," "owing to the necessity of collecting material *in time* for the present report."

3. *That his method in collecting scientific data is uncritical; he fails to state exactly the points from which measurements were made, to explain his modus operandi, or to give an objective account of the previous theories of the head form, while there are many errors and inconsequences in his tables.*

4. *That his theory is based rather on a cross-section of the facts than on a genetic interpretation of them. It is only a genetic description and explanation of them that can give a trustworthy basis for a theory.* "Durch das Werden wird das Gewordene klar." What we also need in physical anthropology is to learn the methods and grammar of physical anthropology in relation to historical, evolutionary facts. Boas ignores all previous theories of head form, even the American biological (G. Stanley Hall) and sociological (Ripley) interpretation of this large subject.

5. *That he began and finished the investigation in which he was put in general charge without requisite scientific exactness and care.* In the "Introductory" to his report we read the following:

> "A small appropriation was made to test the question and see if the promise of results was sufficient to warrant the continuance of the investigation. *Almost immediately* it became evident that there might be much value in such a study, and the work has therefore been continued, although as yet only on a small scale."

It is to be regretted that he does not state on what grounds it became "almost immediately" evident.

The "mystery" of New York environment could be partially solved either by repeating the same measurements on the same subjects and correcting the tables or by attacking this big problem with less temper, but on a really new, scientific plan, which can stand any professional criticism. This was and is the only way to

save both the public and science from prejudicial, provincial, and narrow theories.

To conclude: *I contend that the theories advanced by Boas in regard to physical changes in the immigrants to the United States and their children neglect the various influences which, in different degrees, affect different subjects in the tests, and pours all data from whatever source into the statistical mill, which in consequence expresses an anthropologically meaningless result.*

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DESCRIPTION OF A WINNEBAGO FUNERAL[1]

By OLIVER LAMERE and PAUL RADIN

ON the first day of June, 1911, there died in Winnebago, Nebraska, Mr J. M., a prominent member of the Winnebago tribe and a member of the Bear clan. In accordance with the old Winnebago customs, the first individual to be notified of the death was Mr J. F., a member of the Wolf clan.[2] To Mr F. fell the lot of taking charge of all the funeral rites—dressing the deceased, laying his body in the casket, burying him, and finally, of conducting the elaborate funeral wake lasting four nights.

One of Mr F's most important duties is to invite the brave men or warriors[3] who play such an all-important part in the wake and

[1] The following description of a Winnebago funeral is based almost entirely on the notes taken by Mr Lamere some months ago, at the funeral of a prominent member of his tribe. Dr Radin's work has been confined to editing these notes and adding additional observations wherever, in his opinion, they were needed for the better understanding of the rites in question.

[2] According to the Winnebago social organization every clan is paired off with another one, which it calls "friend" (hitcakaro). These friendship-groups have reciprocal duties to perform, the most important of which are those relating to the burial of one another's members. They are expected to show the strictest courtesy to one another, may at times exchange clan names, and are at all time forbidden to intermarry. The friend clan of the Bear is the Wolf and that is why Mr F. was called upon to take charge of the funeral obsequies in this particular case. If it is impossible to obtain a member of the Wolf clan, one of any other clan may be called, and, if even that is impossible, it is permissible to select a member of the Bear clan itself, for, as disagreeable as this may be, it is distinctly less disagreeable than not burying a person or omitting to perform those rites that are essential for the welfare of his soul.

[3] Warriors are invited to the wake because, according to Winnebago beliefs, the souls of the enemies they have killed become their slaves in spirit-land and they can order them to take charge of the soul of the recently departed individual, and clear his path of the obstacles that beset him on his journey from the land of the living to that of the spirits. Especially difficult to the passage of the soul is an enormous girdle of fire which it must be carried over to reach the spirit home of its clan. The warrior relates his war experiences, but in so doing he is strongly admonished to be very careful and not tell them in a boastful way or to exaggerate in any detail, for if he does so the soul of the departed would fall into the abyss of fire. In this connection it may perhaps be suggestive to note, that it is not any transgression of the deceased that prevents him from reaching his goal but a transgression of the warrior relating his war experience.

likewise to extend invitations to all who wish to participate in the feast. After the body has been buried, he goes to the home of the deceased and takes away all the household goods that the deceased has been in daily contact with, especially his bed and bedding and his clothes.

In addition to F. another man was sent for, Mr A. W., also a member of the Bear clan. He went through the Bear clan ceremony which was as follows. When the deceased was fully dressed in his Indian clothes and just before he was to be laid in the casket he walked up to him and, taking some paint from a little bundle he carried, he painted a red mark across his forehead, then a black one with charcoal immediately below this one, and finally he daubed his entire chin red. When he was through with this preliminary work he addressed those present as follows:

"You relatives, all that are seated here, I greet you. This ceremony is not anything that we have originated ourselves, but it was known to be the proper thing to do by our ancestors. It is for that reason that I have made the markings upon the face of my son, in order that he may be recognized by his relatives in spirit-land. And I have also given him the material with which he may talk, *i. e.*, tobacco,—that with it he may entreat the spirits to grant all those years that he fell short of[1] to his relatives still living.

"Now, it is said, that the members of the Bear clan hold death as a blessing and not as anything to be mournful over. I do not mean that I do not feel sorry for the children of the deceased and that I rejoice in his death but it is the belief of the members of the Bear clan that the same happiness should come to them at death that comes to us during life when a bear is killed and brought to the village for food.[2]

"For now indeed my son shall walk with a road that has been cleared from all obstacles; and his claws shall be sharp; and his teeth shall be

[1] The Winnebago believe that the spirits grant to each individual a certain quota of years. By years they do not mean merely the years themselves but all that a normal individual accomplishes in his lifetime, such as the honors he acquires, the scalps he obtains, the food he eats, etc. It is to be noted that there is no belief in any fixed maximum age for mankind but that this maximum varies with each individual and consequently this request for the "unlived increment" of years is as justifiable in the case of an old man as in that of a child.

[2] According to some, the red marks on the chin are supposed to symbolize the joy of the individual at his death, just as if he were opening his mouth to laugh and his gums were to be seen.

sharp; and nothing indeed shall cross his path. And in this, his walk to the spirit land, he shall tread upon us the life that he has fallen short of upon this earth. And he shall walk just as the original bear clansmen walked, when they originated and when they approached this earth. And now will I sing him the songs that they sang as they came, that he may take them with him in his journey to the spirit land. And it is said that there is no other place prepared for us in the hereafter."

Then he sang the four clan songs.[1]

When the songs had been sung, it was just about noon and, as dinner was ready, we all sat down and A. W. filled a pipe and, when he was ready to smoke it, he began to speak again to the following effect:

"Relatives all that are present, I greet you. It is good that this many of you have come here and it is said that the soul of the deceased remains hovering around about this place four days and we should partake of food with him for that period. It is therefore that we do this. And it is good that this many of you relatives have come here and have helped out with the food and dress for the deceased."

He then mentioned the different things that had been given by different individuals. Then he lit the pipe and took a few puffs and sent it around to the left of him. With the pipe he also passed a pitcher of water from which we each took a sip.

During the morning Mrs R. came in and combed the hair of the deceased's wife and likewise gave her a present, telling her that she hoped that through this gift she might be able to dry her tears. Another person also came in the morning bringing a gift of leggings and a blanket for the deceased to wear. He likewise brought the casket. While the body of the deceased was being prepared this person addressed those present as follows:

"Relatives all that are present, I greet you. If my nephews would sit here I would talk to them."

Then the sons of the deceased sat with their mother and sisters. Then the same person continued:

"My sister, it is said that it is best not to weep and that a widow should not mourn too much as the people would then make fun of her;

[1] These songs have been obtained in a different connection and will appear in a subsequent publication.

as well as for the reason that you have children and for their sakes you should look forward to life and live for them. And it is said that we should keep up this (mourning) for at least four years. And indeed there is nothing funny about this that I am going to say, namely that we should not cry, but instead keep up a good spirit. I do not mean that I am glad that my brother-in-law is dead. But even though you may weep, some one might come in and say that it behooves you more to show them your teeth than your tears. By this they mean that you should smile.

"And again it is said that one should not cry, because when a body is laid in the ground there is no more hope of its ever returning again. Now indeed, my nephew, the one that has been advising you in your daily affairs has ceased to breathe and you are the only ones left to look after yourselves, your little brothers, and your mother; and therefore you should love one another and do your mother's bidding."

While we were eating C. P. came in and spoke as follows:

"Relatives, all that are present, I greet you. It is good that you all have come here and are comforting this house of mourning. It is good that J. H. has brought a casket and also brought clothing for the deceased to wear and food for the people to use during the four nights' wake. And indeed he has also promised a hog for the four nights' feast He did not do this in order that he might boast of it in public but nevertheless how can anyone help oneself in expressing one's thanks. My brother likewise came with the intention of furnishing some of these things but, inasmuch as J. H. has furnished them beforehand, he placed ten dollars in the hands of the deceased's wife. He did not, however, tell her for what purpose he gave her the money and I, therefore, take the liberty of telling her that the gift is meant for anything that she might desire to buy. Now my relatives, this is no time for happiness, but I am glad, nevertheless, that so many of our relatives are present and I am thankful for what you have done. I greet you all."

Then the casket was placed in a spring wagon and taken to the Winnebago cemetery. When we got there the casket was lowered into the grave. When this was over A. W. spoke as follows:

"Relatives you all that are present, I greet you. This many of you have followed my son to this, his last resting place. Further than this, he has ceased to walk in this life. And truly, this many of you have felt sorry for him. All the ceremony that has been taught me I have already said and I have already gone through the same. And I have given him

the emblem and the material to talk with and therefore he will plead for us, his relatives, when he gets to the end of his journey, that we may live the life he fell short of on this earth, and that he may tread firmly upon us, as he walks to the spirit-land. All this I have said before, but nothing was taught me to say at the place where we are now, except that we should step over the grave just as our forefathers did when they originated. They were holy and they entered this life on a perfect day just as this one is today, and, inasmuch as they were holy, all the ground that they touched was also holy and therefore we should step over the grave."

Then we stepped over the grave. We then went to our respective homes.

That same evening the four nights' wake began.[1] When all the invited guests had arrived and were seated, the feast was spread before them. Then A. W. spoke as follows:

"Relatives, all that are seated here, I greet you. It is good that this many of you have come tonight. You know that we are not creating any new ceremony but are simply following up what our forefathers have learned to be true and good. And, as it is said that we should not weep aloud, therefore you will not hear any of us making any utterings of sorrow. And even though we may be silently weeping, should any one come up to us, we will look upon him smiling. We therefore beg of you not to think any the worse of us should you find us happy in mood. And now I am ready to turn over the tobacco and water to J. F. Thus I express my thanks to you all that are present."

Then J. F. took the tobacco and water and spoke as follows:

"Relatives, all that are present seated here, I greet you. It is good that so many of you have come to our humble affair and, as our ancestors have learned that this was the proper way to do, so am I glad that it was given to me to handle the corpse as I am certain that I will be strengthened by it. I will now pass the tobacco to Mr X. He is a brave man and he will light the pipe and pass the water before we eat and after

[1] According to Whitebreast, now deceased, the wake originated as follows. Once upon a time, long ago, a man died and four warriors got together and decided to go to the people of the deceased and comfort them and make them think of other things besides their sorrows. They therefore went to them and told of their war experiences.

The above "explanation" of Whitebreast which Mr Lamere embodies in his notes is unquestionably a fragment of the origin myth of the wake as given by the Bear clan. It does not, however, correspond in any detail to the version told by his nephew and collected by Dr Radin.

supper he will tell the deceased a route to the spirit-land. Now I thank you and I greet you."

Then the brave man took the tobacco and filled the pipe and, after taking a few puffs from it, passed it to the left and it thus went around, each person taking a puff from the pipe and a sip from the pitcher of water. Then the feast began. When it was over and all the dishes were cleared away and every one was properly seated then the brave man greeted them again:

"Relatives, I greet you. As we are not creating anything new and as it has been known to be good by our ancestors and as it is said that if anyone exaggerates a story in a case like this it will cause the soul to stumble, therefore I will tell my war experiences to my relative (the deceased) exactly as I remember them. I greet you all."

He then proceeded to tell his war experiences. When he had finished he spoke as follows:

"Relatives that are present I greet you. As I have said before, I do not wish to cause the soul of my recently deceased relative to stumble and I have tried to tell my story as accurately as I could. It is said that the souls of the ones killed in battle are at the mercy of the victor and I therefore command the souls of the ones I have killed to lead and guide my relative safely through spirit-land. I greet you all."

He then passed the tobacco to another brave man present who in his turn greeted those present and related his war experiences. After two warriors had told their war experiences they stopped for the night, to continue on the second night. The second and third nights were the same as the first. About the evening of the fourth night, when all the people invited were present, A. W. spoke again in the same strain as on the first night, and when he had finished he passed the management of the feast to J. F. The latter then passed it to F. This one now lit the pipe and passed it around together with the water. All partook of the feast then. After supper A. W. reported all the donations that were made to them naming each giver and the amount of the gift and thanking them and praising them for their generous gifts. Then F. told the soul the route it must take in its journey to the spirit land and how it

must behave at different places on the path.[1] Then a warrior told his war experiences and after thanking the people passed the tobacco to the next warrior who in turn related his war experiences.

The amount of gifts was then figured out and they tried to arrange matters so that the warriors were through with their stories about midnight. At midnight games were played with the donations as prizes. The gifts generally consisted of twelve three-yard calico pieces or money equal to that amount of calico, twelve strings of beads, etc. These were the gifts used as prizes. Other donations of food were made for the four nights' feast. A. W. was in charge of the games and he likewise designated what games were to be played. They generally play the games the deceased was fond of, so in this case they played the moccasin game and cards. After all the donations were exhausted and the games finished a brave man was called upon to give a war whoop in thankfulness for the sun who brings the daylight and to all the spirits above and below. Then A. W. greeted the guests again and thanked them for coming and the wake was over.

In olden times the widow was supposed to continue single for four years. She is strongly admonished nevertheless not to continue in low spirits and that she shall consider herself free to act in any way that will make her happy. She is told to play games or dance or in fact do anything that will make her forget her sorrow and that no one will hold her conduct against her as disrespectful to the deceased. As this admonition is given to her by the sister or aunt of her deceased husband, the only people who could properly reproach her, namely the members of her husband's clan, it has all the more weight. This prohibition of weeping is further strengthened by the fact that it is customary to say that any woman who weeps too profusely at the death of her husband is in reality thinking, in the midst of her tears, of the one she is going to marry next. The people will then tell one another not to put themselves out

[1] This story is one of the most famous myths among the Winnebago. In the Nebraska division of the tribe, for some reason or other, F. claims to have the sole right to relate it but most Indians vigorously resent this assumption on F.'s part and there can be little doubt that the right to tell this story belongs to any number of people.

too much as the widow will soon forget her mourning and show no respect to the memory of the dead but instead look after her own pleasures.[1]

WITTENBERG, WIS.

[1] As another and more complete account of the Winnebago wake is to appear in another place we do not wish to overburden this short sketch with too many notes. It professes to be merely the account of what an eye-witness saw on a single occasion. If there are any variations from what is generally considered as the type, this must be ascribed either to the negligence of those who performed the ceremony or to the existence of a number of different ways of performing it. Compared with other accounts of the wake of the Bear clan, the foregoing sketch contains two notable omissions, first the absence of an address to the body of the deceased as it is lying in state, and secondly the absence of the rites connected with the placing of a stick at the grave of the deceased and the counting of coup on the part of the warriors.

The differences between the wakes of the different clans seem to center principally upon the differences in the clan markings and in the objects buried with the deceased. These objects are generally the specific possessions of the clans. For instance a member of the Thunder clan is always buried with a Thunderbird club (na^{n}mantce) and a member of the Bear clan with the stick emblematic of his power as a soldier and which is known as na^{n}mañxinixini.

ARCHEOLOGICAL EVIDENCE AS DETERMINED BY METHOD AND SELECTION

By HARLAN I. SMITH

ARCHEOLOGICAL evidence, particularly such as is contained in specimens and illustrations, is, no doubt, often handled in such a way that it is very misleading as a basis for the reconstruction of prehistoric ethnology. This is, of course, not because of any conscious attempt to mislead but because of the particular methods of making the collections, and, in some cases, because of the practical selection of illustrations.

A collection made by a farmer's boy differs from one made by a man trained in archeological technique; one obtained by excavation from another collected from the surface. The collection gathered by a connoisseur differs from the collection made by the scientist who endeavors to obtain, in an unprejudiced and disinterested manner, the evidence, the whole evidence, and nothing but the evidence. Archeological material, being necessarily fragmentary, readily lends itself to misleading reconstruction. The selection of unique specimens for exhibition in a museum or for illustration, side by side with common objects, leads to misunderstanding unless the label or the text is carefully read. A unique specimen may be a sport, and single finds must be considered as possibly unique until duplicated. Collections from single or special sites may also be misleading.

A collection such as is made by a farmer's boy from the surface of the ground, for instance in the Ohio Valley, will probably contain many arrow points chipped from stone, a few celts pecked from stone, some grooved axes, and perhaps a perforated slate tablet, with but few other objects. One made by an experienced archeologist on the surface in the same region will also include fragments of pottery. The average farmer's boy discards these because they are broken, or because he does not recognize the potsherds as

objects of human handiwork. Sometimes he even believes them to be pieces of petrified bark.

If the archeologist makes his collection, not only from the surface, but also by excavating into such places as mounds, graves, and village sites, his collection will contain relatively few arrow-points, celts, grooved axes, and the like. It will include a large number and a great variety of objects made of bone, many of antler, and not a few of shell. There will also be fragments of pottery. The reason that a collection made from the surface by both the boy and the archeologist, contains proportionately more arrow-points than the one made by the archeologist in excavating, is no doubt partly because these objects are more easily seen on the surface of a field which has been washed by the rains of a season than they are in an excavation where they are partly covered with earth dust. The reason that the objects of bone, antler, and shell are found in excavating is that in the ground they are protected from the sun and rain. Such of them as have been left upon the surface or are brought to the surface by the burrowing of animals, the cultivation of fields, and the like, are soon cracked by the sun and frost, broken by the tread of man and beast, and finally wholly disintegrated. Possibly such objects are more easily discovered in the excavations than the arrow-points, because of their average lighter color. Celts and grooved axes are probably rare in the excavations, because they are relatively rare everywhere, and they are found in undue proportion on the surface because there all, or nearly all, the objects of bone, antler, and shell have been eliminated.

The collection gathered by a lover of specimens as such often contains art treasures, objects made of precious or semi-precious material, unique, ceremonial, or mysterious things. Usually there are few or no examples of raw materials, objects in process of manufacture, broken or repaired artifacts, or the common things which are more illustrative of the life of the prehistoric people under investigation than are the "gems" or monstrosities of the collection.

The collection made by a scientist should be obtained with an

endeavor to understand the whole life of the people, and in it the unique pieces, perhaps formerly owned by a chief or shaman, bear a true relation in numbers to the common manufactures of the whole people. Such a collection may be likened to a merchant's store of goods after he has taken his inventory and replenished his stock by filling up the gaps. Even this collection sometimes falls short for at least two reasons. The archeologist, being human, often runs into a rut and, becoming unconscious of his special interests, collects certain things at the expense of others. Moreover, he is able to obtain only those things which do not disintegrate, and what remains also requires laborious repairing and restoration. These remnants must always fail to present evidence as satisfactorily as a collection from a living people, none of whose manufactures are as yet decayed, and whose physique, language, and philosophy are all available for study.

The illustrations of archeological objects, such as are published in a report where an endeavor is made to show all the forms of a region, give a false impression as to their relative abundance. A unique specimen of course must be figured, whereas there is no need of going to the expense of figuring duplicates of the more common objects, although several specimens may be used to show the range of size and individual variations. Nevertheless a unique object has a visual presentation far greater than its relative abundance warrants. This is a practical problem due to the expense of making and printing illustrations. Any false idea gained by glancing at the illustrations and neglecting the text can be corrected only by carefully reading the latter.

The same general idea holds good in regard to museum exhibits. There is a practical difficulty in the way of exhibiting a very great number of exact duplicates. No one would retire a unique specimen although exhibited together with only three or four common specimens, for fear that it would give the impression that there was one of these to every three or four of the others, even though the real proportion might be one to ten thousand. There are practical reasons for the method of selecting illustrations and specimens for exhibition, but in carrying on investigation one must also take

into consideration facts not shown by the museum exhibits or the illustrations.

A unique specimen may be the single great production of a great artist, or it may be only the offspring of an idle moment, made without serious consideration and perhaps by an abnormal individual—a mere freak, unworthy of consideration in the study of native craftsmanship. If, in making a collection in the field, we are satisfied to end our search for each kind of object as soon as one example is secured, it will never be known whether such an object is the common everyday tool of the people, or a freak, or again the unique product of a master hand.

A collection from a single or peculiar site may lead to an entirely erroneous conclusion if one is satisfied with the results obtained in this one kind of place. For instance, objects from a grave—which may be that of a man, woman, or an infant—may be both characteristic only of grave finds, not typical of the whole culture of the people, and also peculiar to males, females, or infants, as the case may be. Again collections from the part of a village site near the water do not permit us to generalize with regard to the life of the people. The objects found in such a peculiar site may have been the property of a certain peculiar type of individual—a potter, metal-worker, or shaman—or of a class of individuals—fishermen, women, or children. It may be that the children always played in that part of the village, and that these objects were used only by the children. A collection made a few miles away might give one a widely different impression of the same material culture. A collection from one of our own fishing villages would give one idea of American life; another from a rural village, even if only a short distance away, would give an entirely different conception of the culture of our people as a whole. By keeping these, among many other points, constantly in mind, the archeologist may contribute much more in reconstructing prehistoric ethnology than otherwise would be the case, and his contributions become by no means unimportant in a study of the laws governing human development.

GEOLOGICAL SURVEY,
OTTAWA, ONT.

PHILIPPINE LITERATURE

By FRANK R. BLAKE

THE native population of the Philippine Islands is made up of a number of different tribes, which fall naturally into three groups, *viz.*:

a. The mountain pagan tribes, including the dwarf-like Negritos, doubtless the aboriginal inhabitants of the archipelago.
b. The Mohammedan Moros of Sulu and Mindanao.
c. The Christian tribes, the Indios or Filipinos of the Spaniards, who form the bulk of the population.

All these tribes, with the possible exception of the Negritos, speak languages which belong to the same linguistic family, the Malayo-Polynesian or Indonesian, embracing the languages spoken on almost all of the islands of the Pacific, on the Malay peninsula, and on the distant island of Madagascar. Every tribe, however, in each of these different groups, has its own language, distinct from those of its neighbors.

These languages have produced little or nothing which can claim to be literature in the sense of elegant and artistic writing. The literature of the Philippine languages is literature only in the broader sense of written speech, and it is in this sense that the term "Philippine Literature" is used in the present paper.

Few of the languages of the pagan tribes exist at all in written form. The Tagbánwas of Palawan, the long, narrow island stretching from Borneo towards Luzon, and their northern neighbors, the Mangyans of Mindoro, possess native alphabets, but these are probably not employed except for short inscriptions.[1] All other works in the languages of this group are printed in Roman type and are practically all of a religious character, being written by various

[1] Cf. A. B. Meyer; A. Schadenberg; and W. Foy, *Die Mangianschrift von Mindoro*, Berlin, 1895; F. Blumentritt, *Die Mangianschrift von Mindoro*, Braunschweig, 1896.

missionaries for the conversion and religious edification of different pagan tribes. Only five languages possess any written monuments, and none of these more than one or two specimens. Of special interest is the work of a member of the Tiruray tribe of Mindanao in Spanish and Tiruray, on the customs of his fellow-tribesmen.[1]

The two principal languages of the Mohammedan tribes or Moros are Sulu, which is spoken mainly in the domains of the Sultan of Sulu on the chain of small islands extending from Mindanao to Borneo, and Magindanaw, the speech of the most powerful tribe on the large island of Mindanao.

The Moros[2] are unacquainted with the art of printing, their literary monuments being all in manuscript form, written in a slightly modified variety of the Arabic alphabet, similar to that used by the Malays of the Malay peninsula.

Their writings may be classified under four heads:

a. Historical annals, more or less legendary, consisting principally of genealogies of the datos or Moro chiefs.

b. Legal codes, based on various collections of Arabic law.

c. Religious texts, translations of the Kuran and its commentaries, of the Hadith or traditions regarding Mohammed, orations for the different Mohammedan festivals, etc.

d. Writings of varied character, stories, magic-texts, letters of the different datos, etc.

Almost all Moro manuscripts begin, just as most Arabic books do, with the Arabic phrase *bismi 'llâhi 'rrahmâni 'rrahîmi*, "in the name of God, the Compassionate, the Merciful." This is usually followed by a sentence or two in Malay. The Moros derive their learning from Arabic and Malay sources, and consequently take pride in airing their Arabic and Malay erudition.

Practically all Moro books are thus written by the Moros themselves. There is but one work, so far as I know, in a Moro language written by a foreigner, a printed catechism of Christian doctrine in Spanish and Magindanaw by a Jesuit missionary.

[1] J. Tenorio (a Sigayán), *Costumbres de los indios tirurayes*, Manila, 1892 (two columns, Spanish and Tiruray).

[2] Cf. N. M. Saleeby, *Studies in Moro History, Law, Religion*, Ethnol. Survey Pubs., Dept. of Interior, vol. IV, part I, Manila, 1905.

The Christian tribes constitute by far the most important element of the native population, both on account of their numbers and the comparatively high degree of civilization to which they have attained. The various tribes, while speaking distinct languages, have practically the same characteristics and customs, and really form one people.

At the time of the Spanish discovery and conquest, in the 16th century, the now Christianized Filipinos possessed native alphabets similar to those still used by the Tagbánwas of Palawan, and the Mangyans of Mindoro. There are notices of native Mss. in at least one Spanish writer,[1] but none of these have been preserved to our day, all existing works dating from the Spanish period. Moreover, even the ancient alphabets have been forgotten. All Philippine books with, so far as I know, but one exception, being printed in Roman type. This unique work, published in 1621, is an Ilokan catechism printed in Tagalog characters by the Austin friar Francisco Lopez.

The number of works published in the various languages of the Christian tribes down to 1903, according to the best bibliographies, 1898 and 1903 respectively,[2] is approximately as follows. Bisayan and Tagalog stand first with something under 300 works each. The next in rank, Ilokan, has less than half that number. Then follow, in a descending scale, Bikol with about 60, Pangasinan about 30, Pampanga 19, Ibanag 12, Kuyo 6, Zambal 3, Batan and Kalamian 1 each. In all there are about 800 works in the eleven languages here mentioned.

These books are of all sizes varying from small pamphlets of nine or ten pages to quarto volumes of six and seven hundred. The numbers here given, especially in the case of Tagalog and Bisayan, have probably been considerably augmented in the last few years.[3]

[1] Cf. *Report of Philippine Commission*, 1900, III, p. 403.

[2] W. E. Retana, *Catálogo abreviado de la biblioteca filipina*, Madrid, 1898; T. H. Pardo de Tavera, *Biblioteca Filipina*, Washington, 1903.

[3] In Retana's latest bibliography, *Aparato bibliográfica de la historia general de Filipinas*, 3 vols., Madrid, 1906, the only works in the native languages listed from 1903 to 1905 (about 25) are in Tagalog.

The works written in these various languages are composed in both prose and verse, the verse being apparently of native origin.

Tagalog verse,[1] which may serve as an example, consists of lines containing the same number of syllables, and the ends of the lines in the same stanza must be in assonance with each other according to certain definite principles. The final syllables of all the lines of a stanza must have the same vowel, whether this vowel is final or is followed by a consonant. Of words ending in a consonant, there are two classes, those ending in *p*, *b*, *t*, *d*, *k*, *g*, *s*, and those ending in *l*, *m*, *n*, *ng*, *y*, *w*. Any word of one class may be used in assonance with any other word of that class, provided the vowel is the same, but words of the two classes can not be used together in the same stanza. For example *bondók* 'mountain,' ending in *k*, may be used in assonance with *lóob* 'heart,' ending in *b*, and *mahál* 'noble' ending in *l* with *biláng* 'number,' ending in the guttural nasal *ng*. It is to be noted that the words of the first class end in stop sounds or the spirant *s*, *i. e.*, in noised sounds, sounds accompanied by considerable friction of the escaping air, while the words of the second class all end in what are known as sonorous sounds, sounds made with little audible friction, and are characterized by greater resonance of the speech organs. Words with final vowel also fall into two classes, those with simple vowel, *e. g.*, *táwo* 'man,' and those with so-called guttural vowel, *i. e.*, a vowel followed by the glottal catch, *e. g.*, *walâ* 'not having.' Words of one of these classes can not be used in assonance with those of the other, nor can a word ending in either kind of vowel stand in assonance with a word having a final consonant. The difference between these two classes of vocalic endings is also apparently a difference in sonorousness, a simple vowel being more sonorous than one followed by the glottal catch. The principal Tagalog meters consist of seven, eight, twelve, or fourteen syllables to a verse, and three, four, five, or eight verses to a stanza.

The great majority of the works written in the languages of this group, at least five-sixths, are of a religious character, written

[1] Cf. W. G. Seiple, *Tagálog Poetry*, JHU Circs., Vol. XXII, No. 163, June, 1903, pp. 78–79.

by the friars of the various orders for the instruction and edification of their flocks, for in the Philippine Islands under the Spanish regime, the friars had become the occupants of practically all the parishes in the archipelago to the exclusion of the native secular priests. This was one of the chief causes of the antagonism of the people towards the religious orders. Many of these religious works are simply translations from the Spanish. All the works in Kuyo, Zambal, Calamian, and Batan are religious, and in all the other languages except Tagalog books of a secular character are very rare; for example Bisayan and Ilokan which rank next to Tagalog in this respect have about a dozen each. These religious works consist of catechisms and manuals of Christian doctrine, books on deportment, lives of the saints, collections of sermons, novenas or series of nine days prayer to some saint, etc., the novenas being by far the most numerous.

The class of writings which stands next to the religious works in point of view of numbers, is the poetical romance or *corrido*, the latter term being a corruption of the Spanish *ocurrido*,[1] the passive participle of the verb *ocurrir* 'happen.' These are practically confined to Tagalog. They are remarkable tales of the adventures of royal or noble personages, usually in some remote or imaginary country, *e. g.*, *Pinagdaánang búhay ni Don José Flores at nang princesa Virginia na anák nang háring Magaloaes sa Kaharíang Turkia*, "The life of Don José Flores and the princess Virginia, daughter of king Magaloaes in the kingdom of Turkey"; or *Corrido at búhay na pinagdaánan nang principe Orontis at nang reinang Talestr is sa kaharían nang Temisíta*, "The story and life of prince Orontis and queen Talestris in the kingdom of Temisita."

The corrido entitled *Pinagdaánang búhay in Florante at ni Laura sa Kaharíang Albania*, "Life of Florante and Laura in the kingdom of Albania," written in 1870 by Francisco Baltazar, a native of the former province of Laguna near Manila, is considered the best poem in Tagalog. It opens in the following style:

[1] The Spanish word, however, never means romance or tale.

1) Sa isáng madilím gúbat na mapanglão
dawág na matiníkay waláng pagítan
hálos naghihírap ang kay Febong sílang
dumálao sa lóob na lubháng masúkal
2) Malalakíng káhoy ang inihahandóg
páwang dalamháti, kahapísa't longkót
húni pa nang íbon ay nakalulúnos
sa lálong matimpí't nagsasayáng lóob
3) Tanáng mangá báging na namimilípit
sa sangá nang káhoy ay bálot nang tiník
may búlo ang búnga't nagbibigáy sakít
sa kangíno pa mang sumágí't malápit.[1]

"There was a dark and lonely wood, choked with thorny bejuco, into whose tangled interior the rays of the sun could scarcely pierce. Tall trees presaged trouble, sadness and melancholy; the song of the birds had a mournful sound even to the bravest and most joyous heart. All the vines which wound about the branches of the trees were encased in spines. Fruits hung rotting, threatening disease to whoever approached."

Dramatic productions, usually styled *comedias*, are found in Tagalog, Bisayan, and Ilokan. Their favorite theme is a contest for supremacy between some Christian and some Moro or Mohammedan state, in which the Christians are always victorious. This theme is a reflection of the long struggle which the Christian Filipinos had with their turbulent Moro (Mohammedan) neighbors on the south, the Sulus and Magindanaos. From the end of the 16th century, when the Spaniards first came in contact with the Moros, until the introduction of steam gun-boats about the middle of the last century, these bold pirates harried the coasts of the northern islands, just as in the Middle Ages the Northmen devastated the shores of Europe. For years neither property nor life was safe, and hundreds were carried away into slavery. It is but natural that these times of storm and stress should have left a lasting impression on the minds of the Filipinos, and that they should attempt to get even with their Mohammedan foes, if only on paper.

After the American conquest a number of plays were produced

[1] Notice the assonant syllables, *ao* (=*aw*), *an*, *ang*, *al*, in the first stanza; *og*, *of os*, *ob*, in the second; and *it*, *ik*, *it*, *it*, in the third.

which were directed against the rule of the United States, the so-called "Seditious Drama." One of the best known of this class of plays is *Hindî akó patáy*, "I am not dead."

The corrido and the drama are both without doubt borrowed forms of literature, but not so the lyric poetry. Here we have, if anywhere, the germs of a literature in the narrower sense. Much of this poetry exists only in the mouths of the people, though some, principally Tagalog, has been written down. Like the poetry of Oriental peoples in general it is often difficult to understand. These poems are mostly short and epigrammatic, consisting frequently of but one stanza of three or four lines. The following will serve as examples:

may laláki masigyá,
ginóo kun tumugpá,
aitá kun sumalónga.
"There are some valiant men
Who are great lords when they embark,
But Negritos when they come to land
(*i. e.*, they are brave until it comes
to real fighting)."

púsò ko'y lulutanglútang
sa gitnâ nang kadagátan
ang áking tinitimbólang
títig nang matâ mo lámang
"My heart sways up and down like a float
In the midst of the sea,
The goal of my restless course
Is the gaze of thine eye alone."

The Filipinos are very fond of proverbs and riddles which are usually cast into poetic form. Many of their proverbs are borrowed from Spanish, *e. g.*,

kahíma't paramtán ang hayop na makhín,
magpakailán ma'y makhín kun tawágin.
"Though the monkey be clothed,
he will always be called a monkey."

This is the Spanish: *Aunque la mona se vista de seda mona se queda.* Many of the proverbs, however, are doubtless of native origin.

Examples of native riddles are:

Muntíng dagatdagátan,
Binabákod nang dangláy.
A little lake fringed with reeds [*i. e.*, the eye].
Nang umága'y tíkum pa
Nang mahápo'y nabuká.
At dawn its mouth is closed,
In the evening it is open [*i. e.*, a flower].

Newspapers and periodicals have been published in the three principal languages, Tagalog, Bisayan, and Ilokan. These are usually in two languages, a native dialect, and Spanish. Sometimes they are printed in parallel columns, native dialect and Spanish translation.

Portions of the New Testament, the Gospels and Acts of the Apostles, have been translated into the principal languages, under the auspices of the British and Foreign Bible Society. In all probability a translation of the whole Bible is contemplated.

Books belonging to departments of literature other than the preceding are comparatively rare and are found principally in Tagalog. There are grammars of Spanish in Tagalog, Bisayan, Ilokan, and Ibanag. Medical works, usually of a practical character, and a few legal treatises, are found in Tagalog and Bisayan.

Deserving of mention among the remaining works is a treatise in Tagalog on the Filipino national sport, the fighting of gamecocks, and the story *si tandáng Basio Makunat* "The Cock Basio Macunat," written by a Franciscan friar in 1885 in order to instil into the minds of the Filipinos the idea that it was best for them not to learn Spanish or attempt to become civilized, that the more ignorant a Filipino was, the happier he would be.

More than one third of all the works treated are anonymous, and the authors of the rest are men of comparatively little note. While many of these authors are Spaniards, a number are true native Filipinos. Francisco Baltazar, the author of "Florante and Laura," the best Tagalog poem, has already been mentioned. So far as I know this is his only production. The most prolific of the writers is one Mariano Perfecto, who composed about fifty different works

in Bisayan on religious subjects. Next to him ranks Joaquin Tuason, with twenty works in Tagalog, also of a religious character.

This brief sketch will serve to give some idea of the extent and character of works in the various Philippine languages. Whether these languages or any one of them will ever develop a real literature, is a question which only the future can answer.

Some persons, struck by the great resemblance which the various Philippine languages bear to one another, have thought it would be possible to fuse these languages into one, and form a sort of national compound language, but such an artificial scheme is certainly impracticable. If the Filipinos are destined ever to have a national language in which a national literature can be written, that language will almost surely be Tagalog, the language of the capital city, and of the most progressive race of the archipelago; a language admirably suited by its richness of form and its great flexibility for literary development, and needing but the master hand of some great native writer to make it realize its latent possibilities.

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ON THE PUELCHEAN AND TSONEKAN (TEHUELCHEAN), THE ATACAMEÑAN (ATACAMAN) AND CHONOAN, AND THE CHARRUAN LINGUISTIC STOCKS OF SOUTH AMERICA

By ALEXANDER F. CHAMBERLAIN

I. Puelchean and Tsonekan

THE linguistic relationships of the numerous Indian tribes now or in times past inhabiting what constitutes at present the territory of the Argentine Republic have been the subject of much discussion, and widely divergent opinions have been expressed, even by good authorities, on some of the points involved. The very existence, indeed, of the Puelchean and Tsonekan or Tehuelchean as distinct families of speech has been denied and these languages attached to the Araucanian, etc. But the evidence in hand justifies the recognition of the *Puelchean* and *Tsonekan* as independent linguistic stocks, and they are so listed here.

Puelchean

The territory of the Puelchean stock lies in central and eastern Argentina, from the foot-hills of the Andes to the Atlantic Ocean—now particularly in the region between the Rio Colorado and the Rio Negro. Outes and Bruch (p. 105) define their area as follows: "At the time of the conquest, the Puelches occupied the Province of Buenos Aires (except the country of the Querandíes), the Government of the Pampa, the south of Mendoza, San Luis and part of Córdoba, and the region of the Government of Rio Negro lying between that river and the Rio Colorado. They were divided into three groups: Taluhets, Diuihets, and Chechehets." Concerning the affinities of the Indians known as "Puelches" much difference of opinion has prevailed. D'Orbigny sought to identify them with the ancient Querandíes, etc. Ludewig (*Lit. Amer. Abor. Lang.*, 1858, p. 155) notes their supposed relationship to "the wild Charruas." In 1891 Brinton (*Amer. Race*, p. 326) included them as a

branch of his Aucanian (*i. e.*, Araucanian) stock, but later (1892) seems to have believed in Tsonekan (Tehuelchean) affinities. Deniker (*Races of Man*, 1900, p. 74) regards the Puelches as a "new tribe, sprung from the Patagonians and the Araucans, with a strain of Guaycuru blood." Ehrenreich (1905) gives the Puelches an independent status. Schuller (1906) classifies the Puelches, Tehuelches, etc., all under the head of "Pampas," but incorrectly. The term "Pampas Indians," or simply "Pampas," is often synonymous with the whole or a part of the Puelchean stock, especially the ancient or extinct sections of it. The Diuihet and the Chechehet are termed "Pampas" by the Spanish writers. The burden of evidence in favor of the independent status of this stock has not changed essentially since Hale (in 1840), and, before him, d'Orbigny, distinguished the Puelches from the Tehuelches; and the Salesian missionary D. Milanesio has again (1898) proved the utterly unrelated character of the Araucanian, the "Pampan," and the Tsonekan (Tehuelchean) languages. Outes and Bruch (1910, p. 105), however, still express the opinion that "the language of the Puelches, as yet not studied, seems to be a co-dialect of Patagonian or Tehuelche, but with considerable difference in vocabulary."

The most important literature concerning the Puelchean linguistic stock will be found in the following titles:

1. BARBARA, F. Usos y costumbres de los Indios Pampas y algunos apuntes históricos sobre la guerra de la frontera. Buenos Aires, 1856. Pp. 98.
2. ——. Manual ò Vocabulario de la lengua Pampa y del estilo familiar. Buenos Aires, 1879. Pp. 178.
3. BRINTON, D. G. Studies in South American Native Languages. Phila., 1892. Pp. 67. Also in *Proc. Amer. Philos. Soc.*, vol. XXX, 1892, pp. 45–105.
4. HALE, H. United States Exploring Expedition. During the Years 1838, 1839, 1840, 1841, under command of Charles Wilkes. Vol. VI, Ethnography and Philology. Phila., 1846. Pp. xii, 666.
5. LAFONE-QUEVEDO, S. A. La raza pampeana y la raza guaraní, ò los indios del Rio de la Plata en el siglo XVI. *Congr. Científ. Lat.-Amer.* (Buenos Aires, 1900), vol. V, pp. 21 ff.
6. MILANESIO, D. La Patagonia. Lingua, industria, costumi e religione. Buenos Aires, 1898. Pp. 56.
7. D'ORBIGNY, A. L'Homme Américain (*Voy. d. l'Amér. Mérid.*, T. IV), Paris, 1839.
8. OUTES, F. F. Los Querandíes. Contribución al Estudio de la Etnografía Argentina. Buenos Aires, 1897. Pp. xii, 204.

9. OUTES, F. F. Etnografía Argentina. Segunda Contribución al Estudio de los Indios Querandíes. Buenos Aires, 1898.

10. —— y BRUCH, C. Los Aborígines de la República Argentina. Buenos Aires, 1910. Pp. 149. See pp. 105–106.

11. DE ROZAS, J. M. Gramática y Diccionario de la lengua Pampa. Ms. begun *ca.* 1868.

The Puelchean words cited by Brinton (pp. 49–50) are from d'Orbigny and Hale. The vocabulary given by d'Orbigny (p. 80) consists of 23 words. Hale has a Puelche vocabulary and sentences (pp. 653–656) in comparison with Tehuelche,—"Pampas and Tehuiliche." Pages 92–98 of Barbara's *Usos y Costumbres* treat of "the Indian language," and some dialogues in Puelche and Spanish are given. In his *Manual*, Barbara gives rather extensive material. Father Milanesio, who had been for fifteen years a missionary in southern Patagonia and Tierra del Fuego, discusses the three languages, Araucanian, Tehuelche, and Pampa proper, all of which he recognizes as distinct from one another (the Puelche he terms "Pampa-Tehuelche" or "Pampa proper"). A comparative vocabulary of all three is given. At the Seventeenth International Congress of Americanists, held at Buenos Aires, May 16–21, 1911, Sr Adolfo Saldias of Buenos Aires, described briefly a manuscript grammar and dictionary of "the Pampa language," which had come into his possession with other Mss. from the family of Gen. Rozas. The general, whose acquaintance with these Indians was of long standing, began this grammar and dictionary about 1868. The stock-name *Puelchean* is derived from *Puelche*, the name given to these Indians by their Araucanian neighbors, in whose language the term signifies "eastern people."

Tsonekan (*Tehuelchean*)

The territory of the *Tsonekan* or *Tehuelchean* linguistic stock embraces the whole of Patagonia from the Rio Negro to the Straits of Magellan, over which these Indians have wandered for centuries. Formerly very numerous, they count now probably less than 2,000 souls.

The principal literature concerning the Tsonekan linguistic stock is contained in the following titles:.

1. BRINTON, D. G. The American Race. N. Y., 1891. Pp. xvi, 392.

2. BRINTON, D. G. The Hongote Language and the Patagonian Dialects. In his *Studies in South American Native Languages* (Phila., 1892), pp. 45–52.
3. COX, G. E. Viaje en las regiones septentrionales de la Patagonía, 1862–1863. Santiago de Chile, 1863. Pp. viii, 273.
4. *Descripción de Puerto Deseado en la costa Patagónica con el vocabulario de los Patagones, 2 Diciembre, 1789.* Ms. in British Museum, forming pp. 42–49 of Add. 17, 631. Title given by de la Viñaza (*Bibl. Esp. d. Lenguas Indíg.*, 1892, p. 179).
5. *Diccionario de la lengua Patagónica.* Ms. (of end of 18th cent.), forming pp. 36–39, of Add. 17, 631, British Museum. Title given by de la Viñaza (p. 280).
6. FITZ-ROY, R. Narrative of the Surveying Voyages of his Majesty's Ships *Adventure* and *Beagle* between the Years 1826 and 1836, etc. Lond., 1839. 3 vols., Append. and Addend.
7. DE LA GRASSERIE, R. De la langue Tehuelche. *Internat. Amerik.-Kongr.*, XIV. (Stuttgart, 1904), 1906, pp. 611–647.
8. HALE, H. Op. cit.
9. LEHMANN-NITSCHE, R. Verzeichnis der Wörterbucher der patagonischen Sprache. Append. B. of *Zur Vorgeschichte der Entdeckung vom Gryptotherium bei Ultima Esperanza* in Naturw. Wchnschr., XV, 1900, pp. 385–392, 409–414, 426–428 (Naturwiss. Abhand., Heft 29, Berlin, 1901, pp. 4–47).
10. ——. Two Linguistic Treatises on the Patagonian or Tehuelche Language by Theophilus Schmid, Catechist of the Patagonian Missionary Society. Edited, with an Introduction, by Robert Lehmann-Nitsche. Buenos Aires, 1910. Pp. 58, 41.
11. LISTA, R. Viaje al país de los Tehuelches. Exploraciones de la Patagonía austral. Primera parte. Buenos Aires, 1879. Pp. 82.
12. ——. Mis exploraciones y descubrimientos en Patagonía, 1877–1878. Buenos Aires, 1880.
13. ——. Una raza que desaparece. Los indios Tehuelches. Estudio etnológico sobre los Tehuelches, según observaciones propias. Buenos Aires, 1894. Pp. 125.
14. ——. Lenguas argentinas. Los Tehuelches de la Patagonía. *Anales de la Soc. Científ. Argent.* (Buenos Aires), 1896.
15. VON MARTIUS, C. F. P. Beiträge zur Ethnographie und Sprachenkunde Amerikas zumal Brasiliens. Bd. II. Sprachenkunde. Wörtersammlung Brasilianischer Sprachen. Leipzig, 1867. Pp. xxi, 548.
16. MILANESIO, D. Op. cit.
17. MITRE, B. Catálogo razonado de la Sección Lenguas Americanas. Con una Introducción de Luis Maria Torres. Tomo I. Buenos Aires, 1909. Pp. xliii, 411.
18. MORENO, F. P. Recuerdos de viaje en Patagonía. Montevideo, 1882. Pp. 46.

19. MORENO, F. P. Viaje a la Patagonía austral. Vol. I. Buenos Aires, 1879. Pp. viii, 460, iv.
20. MÜLLER, F. Die Sprache der südlichen Tehuel-het (Tsoneka). *Grundr. d. Sprachwiss.*, II Bd., 1 Abt. Wien, 1882. Pp. 424–428.
21. MUSTERS, G. C. At Home with the Patagonians. A Year's Wanderings over Untrodden Ground from the Straits of Magellan to the Rio Negro. Lond., 1871. Pp. 320. Sec. Ed. (Lond., 1873). Pp. xix, 340.
22. D'ORBIGNY, A. Op. cit.
23. ——. Vocabulaire de la langue des Tehuelches. Ms. in the Bibliothèque Nationale, Paris. It has been published by de la Grasserie, R. (q.v.).
24. OUTES, F. F. *y* BRUCH, C. Los Aborígines de la República Argentina. Buenos Aires, 1910, Pp. 149. See pp. 11–129.
25. PIGAFETTA, A. Premier voyage autour du monde, sur l'escadre de Magellan, pendant les années 1519, 20, 21 et 22. Paris, l'an IX (1800). Pp. lxiv, 416.
26. PLATZMANN, J. Der Sprachstoff der patagonischen Grammatik des Theophilus Schmid. Mit einer Karte des südlichen Amerika. Leipzig, 1903. Pp. 130. See Lehmann-Nitsche, R.
27. *Raccolta di documenti e studi pel quarto centenario dalla scoperta dall' America.* Parte V, vol. III. Roma, 1894.
28. SCHMID, T. Vocabulary and Rudiments of Grammar of the Tsoneca Language. Bristol (Eng.), 1860. Pp. iv, 47.
29. ——. Tehuelche Grammar. Ms. (English), pp. 40. Also Spanish translation (pp. 4). Both printed in Mitre (q.v.).
30. ——. See Lehmann-Nitsche, R.; Platzmann J.
31. VIEDMA, A. Diario de viaje a la costa patagónica. In *de Angelis, P.*: Colección de obras y documentos relativos a la historía antigua y moderna de la Provincia del Rio de la Plata., 6 vols. Buenos Aires, 1835–1837. Also new ed., 1900–1905. See vol. VI.

The first linguistic record of the Tsonekan or Tehuelchean stock is the vocabulary taken down by Pigafetta in 1520, in connection with the Magellan expedition round the world, but not actually printed till 1800, and then rather incorrectly. In 1894, however, as part of the celebration of the quatercentenary of the discovery of America by Columbus, a good reprint, based upon the Ms. in the Ambrosian Library, was published at Rome. It was long practically the only Tsonekan data accessible. Viedma, governor of the Patagonians, collected, in 1780, at San Julian Bay (the place of origin of Pigafetta's list), a vocabulary of 285 "Patagonian words." In 1829 d'Orbigny obtained a vocabulary of 23 words from "the Patagonians or Tehuelches" on the Rio Negro; and, on comparing these with the words of Pigafetta, recognized (p. 215) the identity

of the Tehuelche and the Patagonians. More recently R. Lista, with a vocabulary of 145 words, obtained by him, made a similar comparison of the lists of Pigafetta, Viedma, d'Orbigny, and Musters, thus clinching the identification of d'Orbigny. Musters' vocabulary of 222 words and 17 phrases was collected from the northern Tehuelches. Lista's *Viaje* contains a brief vocabulary (some 60 words) from the region of the Rio Shehuen, near Santa Cruz; his *Una raza que desparece* "a vocabulary and phraseology (some 215 words and 60 phrases) of the Tsoneca or Tehuelche language"; his *Lenguas Argentinas*, a comparative study of the various vocabularies of the Puelche and Tehuelche tongues; his *Mis Exploraciones*, a vocabulary of some 140 words. Moreno's *Viaje* contains a "Vocabulario Castellano Tehuelche, Ahoneckenke ò Tzoneca" of 624 words, obtained from the Indians about Argentina Lake, near Santa Cruz. In his *Recuerdos* he gives a vocabulary of the Gennaken, a language thought by him to be "the ancient Pampean," and distinct from Tehuelchean (Tsonekan) and Araucanian,—some 40 Gennaken words are reprinted by Mitre (pp. 214 et seq.). Cox gives a comparative vocabulary of northern Tehuelche and Araucanian—some writers, with de la Grasserie (p. 612), say that the "northern Tehuelches" are Puelchean, not Tsonekan, but no Puelchean tribes really belong south of the Rio Negro. The "Patagonian" vocabulary in von Martius was obtained from D. Fel. Bauza, a Spaniard. Brinton's Tsonekan material (*Amer. Race*, p. 364) is from von Martius, d'Orbigny, Musters, and Lista; that in the paper of 1892 is from d'Orbigny, Hale, von Martius, Musters, Lista, Pigafetta, and the British Museum Mss., all brief vocabularies. Hale's Tsonekan material consists of a vocabulary of some length, and that in Fitz-Roy numbers 53 words only. Müller's grammatical sketch was based upon the notes of Schmid. De la Grasserie prints the vocabulary (pp. 613–625) of the d'Orbigny Ms., which is quite extensive. He also publishes the vocabularies of Lista, von Martius, Musters, Melanesio and those given by Brinton; likewise the grammatical sketch of F. Müller. This makes his article valuable for those not having access to some of the original works cited. Mitre, in his *Catálogo*, résumés, in the section on Tehuelche, the Ms. grammar of Schmid (pp. 199–211), obtained through the

missionary Bridges, and gives (pp. 218–258) a Spanish version of this grammar, which he also prints at length in English (pp. 259–298) with a Tehuelche-Spanish and Spanish-Tehuelche vocabulary made up from Schmid's grammar. This he states (p. 199) to be "the only grammar of the Tehuelche language in existence." The *Vocabulary and Rudiments of Grammar of the Tsoneca Language* (1860), mentioned by Musters, is referred to by Lehmann-Nitsche in these terms (p. 13): "After the most diligent search I am obliged to confess that I have not been able to discover a single copy of this publication." Two Ms. copies, however, are known to exist: Dr J. Platzmann's facsimile reproduction, and another, formerly in the collection of F. Müller, but now belonging to Dr K. von den Steinen. From his copy Dr Platzmann produced the rearranged *Sprachstoff* (1903), of which Dr Lehmann-Nitsche says (p. 14): "In this arrangement Platzmann was anything but successful; in place of Schmid's able summary the subject matter is split up into two parts, one in Patagon-German-Latin, and the other in German-Spanish-English-Patagon, both in alphabetical order, without any reference to the original which had been so altered in its form." Platzmann's facsimile of Schmid's Vocabulary, etc., is now in the library of Dr Lehmann-Nitsche. The "Two Linguistic Treatises" of Schmid, published in 1910 by Dr Lehmann-Nitsche, are the *Vocabulary and Rudiments of Grammar of the Tsoneca Language*" (pp. 17–58) and (pp. 1–41) the *Grammar of the Tsoneca Language*, from the Mitre Ms. One of the teachers of Schmid in Patagonian, as Dr Lehmann-Nitsche notes (p. 7), was the Indian Casimiro, mentioned by Capt. Musters. With this publication of Dr Lehmann-Nitsche, the valuable data of Schmid, relating to the language of the southern Tehuelches, becomes accessible to scholars. The Tsonekan language is of some interest to students of Shakespeare, since Caliban's "dam's god, Setebos," in *The Tempest*, is a Patagonian deity, the name having evidently been taken from Pigafetta. The stock-name *Tsonekan* is derived from *Tsoneka* (*Tsoneca*), or *Tsonek*, *Chonek*, etc., the term by which they call themselves, said to signify "men," "people." The name *Tehuelche* (see *Puelche*) is of Araucanian origin and signifies "southerners."

II. Atacameñan and Chonoan

The *Atacameñan* and *Chonoan* languages are now, in all probability, completely extinct, although descendants of the Indians, who once spoke them, continue to exist in small numbers in certain parts of the areas concerned. The linguistic relationships of the tribes inhabiting the littoral of the Pacific, in this region, have been by no means clearly established, and other stocks than those generally recognized may also have flourished there.

Atacameñan (or Atacaman)

The territory of the Atacameñan or Atacaman linguistic stock included the region around Atacama, from about 19° to 24° s. lat., the southwestern portion of this area, however, being occupied by another independent stock, the Changoan. This part of South America, especially the eastern and southern sections, is archeologically and ethnologically important as the ancient seat of the so-called "Atacameñan (Atacaman) culture," recently investigated by Count de Créqui-Montfort and others. Boman (p. 58) attributes to the ancient Atacama remains in the Puna de Juyjuy, Santa Catalina, Rinconada, Cochinoca, and Casabindo, going so far as to recognize "one people inhabiting the great zone between the Argentina Puna and the Pacific Ocean." The modern representatives of the old Atacama seem to be the Indians (not, however, "miserable fishermen," as Brinton says) calling themselves *Likan-antai* ("the people") and their language *Cunza* ("our"), surviving to the number of two or three hundred at San Pedro de Atacama, Toconao, Sóncor, Cámar, Socaire, Peine, etc. Of these, according to Vaïsse (p. 10), only about 25 could speak their mother-tongue in 1895; and in 1911 Echeverría y Reyes reports the language as entirely extinct. The Atacama of Chiu-chiu seem to have altogether disappeared. The Atacameñan tongue was, as von Tschudi reports, spoken in the second half of the nineteenth century at Calama (formerly called Atacama Baja), Chiu-chiu, and Antofagasta. Moore, by means of place-names, sought to trace the Atacameñan tongue from Cobija on the coast to Purilari in the interior. The name *Likan-antai*, "people of the village," refers to San Pedro de Atacama, the village *par excellence*. In the Puna de Juyjuy, according to Boman (p. 64),

real Atacameñan names are rare. The number of Atacameños was estimated by d'Orbigny (p. 151) at 7,348, of whom 5,406 were in the province of Tarapaca, and 1,942 in Atacama. Bertrand in 1884 gives the Indian population of the Atacama Desert and the Puna de Atacama as about 4,000, of whom perhaps half were Atacameños and the remainder Changos and Bolivian Indians. The Atacameños of Tarapaca have been absorbed by the Aymará.

The purest Atacameños are to be found in San Pedro de Atacama. The most important literature concerning the Atacameñan (Atacaman) linguistic stock will be found in the following titles:

1. Boman, E. Antiquités de la Région Andine de la République Argentine et du Désert d'Atacama. Tome I. Paris, 1908. Pp. xi, 388. See pp. 38–67.
2. Bresson, A. La Tierra y sus Habitantes. Vol. I. Barcelona, 1878.
3. Brinton, D. G. The American Race. N. Y., 1891. Pp. xvi, 392.
4. de Créqui-Montfort, G. Fouilles dans la nécropole pré-hispanique de Calama. Les anciens Atacamas. *Intern. Amerik.-Kongr.*, XIV (Stuttgart, 1904), 1906, pp. 351–364.
5. Darapsky, L. Estudios linguïsticos americanos. *Bol. Inst. Geogr. Argent.* (Buenos Aires), vol. XII, 1889, pp. 368–380.
6. Echeverría y Reyes, A. Noticias sobre la lengua Atacameña. Santiago de Chile, 1890. Pp. 28.
7. ——. Noticias sobre la extinguida lengua Cunza. Brief abstract of a paper read at the Seventeenth Intern. Congr. of Americanists, Buenos Aires, 1910. In Lehmann-Nitsche: *Sumarios de las Conferencias y Memorias*, etc. Buenos Aires, 1910.
8. Maglio, B. La Lengua de los naturales de Atacama. Santiago, 1890. Pp. 20.
9. Moore, T. H. Vocabulaire de la langue Atacameña. *Congr. Intern. d. Amér., 2e Sess.* (Luxemb., 1877), 1878, vol. II, pp. 44 ff.
10. Philippi, R. A. Reise durch die Wüste Atacama. Halle, 1860.
11. San Roman, F. J. La lengua de los naturales de Atacama. Santiago, 1890. Pp. 20.
12. von Tschudi, J. J. Reisen durch Süd-America. 5 Bde. Leipzig, 1866–1869.
13. Vaïsse, E. F., Hoyos, F., *y* Echeverría y Reyes, A. Glosario de la Lengua Atacameña. Santiago, 1896. Pp. 36.

Bresson (vol. I, p. 887) gives a vocabulary of 23 words obtained during his visit to Bolivia in 1870. Philippi's list (p. 56) is of 60 words. The vocabulary in San Roman contains 148 new words,—the author had the assistance of Father B. Maglio, formerly priest at San Pedro de Atacama. Some grammatical data and a vo-

cabulary of 140 words are given in Moore. Von Tschudi (vol. v, 1869, p. 77) has a vocabulary of 41 words. Echeverría y Reyes' monograph of 1890 contains an Atacameñan vocabulary of 239 words. Brinton's vocabulary (p. 348) of 21 words is from Philippi, von Tschudi, Moore, and San Roman. Darapsky seeks to ally the Atacameñan with Aymaran, but with no success. The *Glossary* of Vaïsse, Hoyos, and Echeverría y Reyes, lists, including numerous geographical names, some 1100 Atacameñan words being the most extensive record of the linguistic material of the stock in existence.

The stock-name *Atacameñan* is derived from *Atacameño*, the Spanish designation of an Indian of this tribe (*Atacameña*, the language), signifying "belonging to, native of, *Atacama*." The etymology of the place-name *Atacama* (town, desert, province, etc.) is uncertain. In Vaïsse (pp. 13–14) the origin is discussed at length, without any of the suggested etymologies from Quechuan or Atacameñan being approved or adopted.

Chonoan

The territory of the Chonoan linguistic stock included the Archipelago of Chonos and the adjacent regions of the Chilean coast, from about 44° to 25° s. lat. The original inhabitants of the Chonos Islands have been thought to be extinct, but Dr C. Martin, as Brinton notes (*Amer. Race*, p. 327), states that the Huaihuenes Indians of the Chonos Islands "were transported in 1765 to the island of Chaulanec, where their posterity still survive." But all linguistic data from Chiloe are Araucanian. Other attempts to colonize the Chonos seem to have been made also by the missionaries, as *e. g.*, on the island of Huar, and on the large island of Chiloe. D'Orbigny classed the Chonoan language as Araucanian, as did likewise Poeppig. Brinton (*Amer. Race*, p. 327) made the Chonos members of his Aucanian (*i. e.*, Araucanian) stock, but observes also that "the language of the Chonos is said to be quite different from that of the Araucanians." Dr Rodolfo Lenz (*Dicc. etimol.*, p. 312) is of opinion that the Chonos were different in language from the Mapuche or Araucanians, and may have resembled the southern Tehuelche and Onas.

The not very extensive literature concerning the Chonoan linguistic stock includes the following titles:

1. BRINTON, D. G. The American Race. N. Y., 1891. Pp. xvi, 392.
2. ESTEVAN, M. Vocabulario de la Lengua Chona (ca. 1612). Ms. cited by Lozano in his *Historia*. Father Estevan is also said to have composed sermons in the Chonoan tongue. See Mitre, *Catálogo*, p. 157.
3. FALKNER, T. A Description of Patagonia, etc. Herefort, 1774. Pp. 144.
4. FITZ-ROY, R. Narrative of the Surveying Voyages of his Majesty's Ships *Adventure* and *Beagle* between the Years 1826 and 1836, etc. 3 vols. Add. and App. Lond., 1839.
5. HYADES, P. *et* DENIKER, J. Mission Scientifique du Cap Horn, 1882–1883. Tome VII. Anthropologie, Ethnographie. Paris, 1891. Pp. vii, 423.
6. MARTIN, C. Ueber die Eingeborenen von Chiloe. *Ztschr. f. Ethnol.*, vol. IX, 1877, pp. 161–181, 317–330.
7. MITRE, B. Catálogo razonado de la Sección Lenguas Americanas. Tomo I. Buenos Aires, 1908. Pp. xliii, 411. See p. 157.
8. POEPPIG, E. Reise in Chili und Peru. 2 Bde. Leipzig, 1836.

In the vocabularies of the Fitz-Roy expedition are included three words of the language of the Chonos Indians, which seem to be all the published material extant. The testimony of Lozano, Estevan, Rosales, J. G. Marti, etc., cited by Mitre (p. 167) counts for the independent character of the Chonoan language.

The stock-name *Chonoan* is derived from *Chonos*, the appellation by which the Indians after whom the islands inhabited by them were called the Archipelago de los *Chonos*, were known to the early missionaries, etc., of Chile. According to Lenz (*Dicc. etimol.*, p. 312), *Chono* is probably the name given by these Indians to themselves. Its etymology is quite uncertain.

III. CHARRUAN

In its greatest extent, the territory occupied by the *Charruan* stock embraced the region from the Paraná to the sea-coast, between the mouth of the La Plata and the Laguna dos Patos, including thus all of modern Uruguay and somewhat beyond. But there has been great difference of opinion as to the status of the Charrúas and the character of their language. Brinton, in 1891, classed them as an independent stock, but later (1898) suggested Tupi relationship, while Lafone-Quevedo (1897) and Schuller (1906) list the Charrúas as Guaycuruan. Ameghino, as far back as 1881, considered them Guaraní (or Tupian). Ludewig (*Lit. Abor. Amer. Lang.*, 1848, p. 155) reports that "the wild Charrúas" were related

to the Puelches; and some have sought to connect them with the Araucanian stock. Outes and Bruch (1910, p. 90) cite the opinion of d'Orbigny that the Charruan language was related to Puelchean, an idea based upon the fact of "its harsh and guttural character." Finck (*Die Sprachst. d. Erdkr.*, 1909, p. 101), admits the Charruan (his *tsarruaisch*) as independent, and, on the whole, we may consider Brinton's first opinion justified and rank Charruan as an independent linguistic stock.

Brinton (*Amer. Race*, 1891, p. 317) listed the following tribes as belonging to the Charruan stock:

Bohanes. On the Paraguay near the Rio Negro.
Chanes. Adjacent to the Bohanes.
Charruas. On the coast east of the Rio Uruguay.
Guenoas. East of the Uruguay.
Martidanes. East of the Uruguay.
Minuanes. Between the Uruguay and Paraná.
Yaros. On the east bank of the Uruguay.

This classification follows largely Hervas. The real Charrúas of Uruguay, like those of Corrientes and the Minuanes of Entre Rios in Argentina, the Bohanes, Yaros, etc., are now all extinct, according to Aráujo and other authorities, although Deniker (*Races of Man*, 1900, p. 572) states that the hybrid descendants of the Chanáses, Querandíes, etc., known as the Talhuet, "were still fairly numerous in 1860 between Buenos Aires and Rio Negro," and in this remnant the old Charrúas may have had some share. In the terrible wars of extermination waged against the aborigines of Uruguay in 1830–1832 few of the Charrúas escaped capture or death. The "last of the Charrúas" (two men and two women) were exhibited in Paris in 1830 as "wild men," dying there some time afterwards. Uruguay has become what Aráujo calls "an American country without Indians." Considerable of the former aboriginal element has, however, been absorbed into the white population.

The principal literature concerning the Charrúas will be found in the following titles:

1. Aráujo, O. El ultima Charrúa. Article in *El Iris* (San Eugenio del Cuarcim) Año I, 2a epoca, num. 6, domingo de diciembre de 1905.

2. ARÁUJO, O. Significado de la voz "Uruguay." Anales de Instrucción Primaria (Montevideo), vol. v, 1908, pp. 762–767.
3. ——. Un país americano que no tiene Indios. Ibid., vol. vi, 1909, pp. 114–119.
4. ——. Diccionario geográfico del Uruguay. Montevideo, 1900. Pp. 1006.
5. *Arrivée de quatre sauvages Charrua*, etc. Paris, 1830.
6. BAUZA, F. Habitantes primitivos del Uruguay. Montevideo, 1895.
7. BRINTON, D. G. The American Race. N. Y., 1891, Pp. xvi, 392.
8. ——. The Linguistic Cartography of the Chaco Region. Philadelphia, 1898. Pp. 30.
9. CAMAÑO, —. Catecismo brevisimo en la lengua Cuënoa. Mentioned by Hervas (q.v.).
10. FIGUEIRA, J. H. Los primitivos habitantes del Uruguay, at pp. 131–147 and 154–156 of *El Uruguay en la exposición histórico-americana de Madrid*. Montevideo, 1892. Also pamphlet with same title (Montevideo, 1894. Pp. 44).
11. GRANADA, D. Vocabulario Rioplatense Razonado. Seg. ed. Montevideo, 1890, pp. 411.
12. GRANADA, D. El idioma nacional. Montevideo, 1900.
13. HERVAS, L. Catálogo de las lenguas conocidas, etc. Vol. i. Madrid, 1800.
14. ——. Saggio practico, etc. Cesena, 1787.
15. KERSTEN, L. Die Indianerstämme des Gran Chaco bis zum Ausgange des 18. Jahrhunderts. Internat. Arch. f. Ethnogr. (Leiden), vol. xvii, pp. 1–80.
16. LAFONE-QUEVEDO, S. Los Indios Chanáses y su Lengua, con Apuntes sobre los Querandíes, Timbúes, Yarós, Boanes, Guënoas ó Minuanes, y un mapa etnico. Bol. d. Inst. Geogr. Argent. (Buenos Aires), vol. xviii, 1897, pp. 115–154.
17. ——. "La Raza Amercana de Brinton." Estudio critico. Ibid., vol. xiv, 1894, pp. 500–528.
18. ——. Progresos de la Etnología en el Rio de la Plata durante el año de 1899. Ibid., vol. xx, 1899, pp. 1–64.
19. LOZANO, P. Historia de la Conquista del Paraguay, Rio de la Plata y Tucuman. 4 vols. Buenos Aires, 1874–1875.
20. MARTINEZ, B. T. Etnografía del Rio de la Plata. Bol. d. Inst. Geogr. Argent., vol. xxii, 1901, pp. 89–121.
21. OUTES, F. F. Los Querandíes. Contribución al Estudio de la Etnografía Argentina. Buenos Aires, 1897. Pp. xii, 204.
22. —— *y* BRUCH, C. Los Aborígines de la República Argentina. Buenos Aires, 1910. Pp. 149. See pp. 90–92.
23. DE SAN MARTIN, J. Z. Tabaré: Indice alfabetico de algunas voces indígenas. Montevideo, 1888.
24. SCHULLER, R. R. Geografía Física y Esférica de las Provincias del Paraguay y Misiones Guaranies. Compuesta por don Felix de Azara . . . en la

Asunción del Paraguay. Año de MDCCXC . . . Bibliografía, Prólogo y Anotaciones por Rodolfo R. Schuller. An. d. Mus., Nac. de Monte Video, Secc. Histor.-filos., vol. 1 (1904), pp. i–cxxxii, 1–478. See on Charruas, etc., pp. lxxxii–cxv.

25. ——. Sobre el Orijen de los Charrúa. Santiago de Chile, 1906. Pp. 158.

26. THOUAR, A. Explorations dans l'Amérique du Sud. Paris, 1891.

The published material in the languages of the Charruan stock is insignificant. The words in Hervas' *Catálogo* (p. 46) and *Saggio* (pp. 288, 289) belong to the Guënoa dialect. He received from Sr Camaño a brief catechism in Guënoa, the examination of which led him to state (p. 197) that "the language shows no affinity with the Paraguayan tongues of which we have grammars and vocabularies." Martinez, on the basis of a very few words, seeks to establish a relationship between the Charrúa and the Tehuelche (also Pehuelche). Outes and Bruch (p. 90) say that "the Charrúa language is absolutely unknown."

The stock-name *Charruan* is derived from *Charrúa*, the appellation of the most important member of the family. The etymology of this term is much disputed. According to Brinton (*Ling. Cart.*, p. 23), *Charrúa* is a Guaraní expression signifying "my men (*che, uara*)." Lafone-Quevedo interprets it to mean "hurtful to me (*che, haru*)," *i. e.*, "my enemies." Schuller (p. lxxxii) seeks an etymology from Guaraní *chana aharu*, "what mutilated people." This is in reference to cicatrices and other bodily mutilations. None of these etymologies is at all satisfactory.

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BOOK REVIEWS.

The RGH Law in Philippine Languages. By Carlos Everett Conant. (Journal of the American Oriental Society, vol. xxxi, part 1, 1910, pp. 70–85.) 9¼ × 6.

The Malayo-Polynesian or Indonesian speech family, seems to have possessed originally a consonant which is represented in the various individual languages, sometimes by *r*, sometimes by *g*, sometimes by *h*, and sometimes by *y*. This consonant is called the RGH consonant. Alongside of this there is another consonant which appears variously in the individual languages as *r*, *l*, or *d*, and is known as the RLD consonant. The changes of these two consonants constitute the most salient phonetic facts in the Malayo-Polynesian family. It is rather remarkable how the various speech families differ in their phonetic tendencies. In the Indo-European family of speech the most striking phonetic interchanges are in the realm of the stop sounds (the so-called Grimm's Law), in the Semitic family they lie in the domains of the sibilants and dental spirants, while in the Malayo-Polynesian family they have to do with the liquids *r* and *l*.

The present article is a discussion of the development of the RGH consonant in the Philippine languages. The following are the chief points made by the author. In the Philippine languages four groups are to be distinguished, according as RGH appears as *g*, *r*, *l*, *y*, viz.:

(*a*) the *g* languages, Tagalog, Bisaya, Bikol, Ibanag, Magindanaw, Sulu, Bagobo:

(*b*) the *r* languages, Iloko and Tiruray:

(*c*) the *l* languages, Pangasinan, Kankanai, Inibaloi, Bontok, Kalamian:

(*d*) the *y* languages, Pampanga, Batan, Sambal.

The *g* languages consistently represent RGH by *g*, but in the case of the other groups some irregularities occur. In the *r* languages while RGH is regularly represented by *r* it also often appears as *g*. In these languages both *r* and *l* can not stand in the same "Grundwort," hence in a word containing both *l* and RGH, the latter may be represented by *g* (regularly in Iloko, also in Tiruray); or by *r*, with assimilation of the *l* to *r* (usually in Tiruray). In the *l* languages RGH is occcasionally represented by *g* especially when an *l* occurs in the word, since two *l*'s can not stand in the same "Grundwort." In the *y* languages RGH appears only exceptionally as *g*.

Finally, at the end of the article a section is added on the three-fold origin of Philippine *g*, probably because *g* is the most common representative of RGH in the Philippine languages. One *g* is original *g*, a second belongs to the RGH series, and a third to the RLD series.

The article as a whole is an important contribution to the phonology of the Philippine languages, and will assist greatly in making clear the exceedingly complicated relationship of *r*, *l*, and *g* in these languages, but the arrangement of the material is not entirely clear and it is difficult to follow the development of the subject. The numerous remarks on peculiarities of the examples cited, which have no connection with the subject matter of the article, as, *e. g.*, the explanation of the initial *g* of Chamorro *gugal* (p. 71), or the pronunciation of the final stops in Ibanag (p. 73), would appear to much better advantage in foot-notes, where they would not interrupt the main discussion. There is no real reason why a special section should have been devoted to the origin of Philippine *g* more than to the origin of Philippine *r*, *l*, or *y*, and the discussion of the origin of any one of them, or at least of the first three, is hardly appropriate unless the RLD consonant is first discussed. It is to be hoped that Prof. Conant will shortly publish his material on the RLD consonant, and help to clear up still further the complicated relationship of *r*, *l*, *g*, *d*, and *y* in the Philippine languages.

FRANK R. BLAKE.

The Incas of Peru. By SIR CLEMENTS MARKHAM, F.R.S. New York: E. P. Dutton & Co., 1910. Pp. xiii + 443, with 16 plates and map. (Price $3.00.)

Sir Clements' interest in the Incas began when, as a naval cadet of fourteen, he visited Peru in H. M. S. Collingwood. He at once began to collect first hand information and to search through published and manuscript records for reliable sources. His narrative is the more interesting because he traveled extensively in the country and is personally acquainted with the localities he describes. He is thus able to apply his own experience to the interpretation of the early chronicles upon which he has depended for the greater part of his material. No one is as well equipped as he to write a history of the Incas. He has mastered their language and literature and for the past half century has been writing about the people and their country.

Many volumes have followed his first work, *Cuzco to Lima*, which appeared in 1856. His best service to the English-speaking public has been rendered in that splendid series of annotated translations of the old Spanish chroniclers. Twelve volumes have already been published

by the Hakluyt Society and six others—*Montesinos*, *Blas Valera*, *Balboa*, *Betanzos*, *Santillana*, and *Martin de Morua*—are ready for publication.

The book opens with a critical estimate of the principal authorities. "The story of the Incas had been told by priests, soldiers, lawyers, by mestizos and by pure-blooded Indians" and from a careful study of these the author writes his fascinating story. Cieza de Leon "stands first in the first rank of authorities"; Sarmiento is the best for historical events; Molina gives the best account of religious practices; Blas Valera and Garcilasso, the most interesting accounts of the life of the people. He calls attention to a recently discovered manuscript by the Indian Pomo de Ayala. Others are important as touching certain special topics: Calancha, the Inca calendar and the only account of the religion of the Chimu; Lazarraga, the wall between the territory of the Incas and the Collas and the image of the Sun which Leguisamo gambled away in a night. This was not the great image from the temple of the Sun in Cuzco, but a small one engraved on a gold covering for a sacred chicha receptacle. The other was concealed before the arrival of the Spaniards and was never found.

The next chapter deals with the unsolved mystery of the megalithic age. The doorway, the enormous size of the stones and excellent masonry at Tiahuanacu are described at length. (The author here fails to give credit to Stübel and Uhle, certainly the best authority.) All traditions tell us that the tribes which formed the megalithic empire came from the south. The ruins point to extensive dominion. In Cuzco there is a cyclopean building and some portions of the remains at Ollantaytampu are of the same type, but the grandest is the fortress of Cuzco. The monoliths near Abancay and the Chavin stone in the province of Huari belong to this period. The empire extended from south of Tucuman to Chalchapoyas, with Tiahuanacu as its center of rule. The most difficult part of the problem of Tiahuanacu is the climatic conditions. How could a region 12,500 ft. above the sea, so cold that corn can not ripen, sustain the population of a large city? Could the elevation have been less? Darwin says that near Valparaiso the land has risen 1,300 ft. and at San Lorenzo 500 ft. within modern times.

It does not appear to the reviewer that there is sufficient evidence to connect all these megalithic remains. Practically the only thing in common is the use of large stones. But at Tiahuanacu they are elaborately carved, squared, and nicely dressed, with doorways cut from enormous slabs; at Cuzco the very large rocks are used in the rough

state; while at Ollantaytampu the stones are beautifully dressed and standing on end with very thin slabs between. At Cuzco the cyclopean masonry is so connected with the other type that both must belong to the same period, and the same thing is true at Ollantaytampu. Some Maya scholars accept the Chavin stone as pure Maya handiwork, but no one would so accept the work at Tiahuanacu. Dr Uhle assigns them to entirely different cultures.

In reference to the change in elevation and climatic conditions about Tiahuanacu, it must be said that some geologists disagree with Darwin. The city was built with reference to the lake which extends more than a hundred miles from N.W. to S.E. across the plateau. The old lake beaches are horizontal and the walls and standing stones are all vertical. Hence both chains of the Andes must have been lifted equally and simultaneously, and this equilibrium maintained through an elevation of 3,000 ft. to meet the required conditions. Is it necessary to assume such a change in conditions? Today there is a very large population about the lake. The plateaus are covered with thousands of sheep and llamas and crops of *oca* and *quinna* are cultivated. La Paz, near by, and less than a thousand feet lower, contains a larger population than did ancient Tiahuanacu and until recently had no better means of transportation. Yet there has been no difficulty in providing a food supply. Fresh vegetables and all kinds of tropical fruits are sold in the market every day. With the strong centralized government that Tiahuanacu must have had, and the extensive domains, which included the valleys, the wants of the people were easily supplied. Again the climate is not so unlivable as 12,500 ft. and "too cold for corn" would seem to indicate. The location is within the tropics—less than 15° S. Even foreigners work, and play tennis and foot ball at greater elevations and enjoy life abundantly.

The author supports the authenticity of the list of a hundred kings of Peru given by Montesinos who evidently copied them from Blas Valera. The average reign of 25 to 27 years carries us back to 950 B. C., but, allowance being made for the succession of other heirs than sons, the initial date is about 200 B. C. The end of the early civilization was caused by an invasion from the south which resulted in breaking up the country into a number of petty, barbarous tribes. A remnant of the wise men took refuge near the Apurimac and there preserved the old religion and customs. After centuries of barbarism these more civilized children of the sun became predominant. Thus the rise of the Incas is satisfactorily explained.

The history of the Incas is very concisely treated. Tupac Upanqui is regarded as "the greatest man the American race has ever produced." Manco's date is given as about 1100 A. D., and the beginning of the line of the Incas with Rocca about 1200 A. D.

The difficult subject of Inca religion is well treated,—the cult of Uiracocha, believed in as the Supreme Being who was creator and ruler of the universe, and the religion of the people which was the worship of the founder of each clan. The Sun was adored as the father of the Incas. The hierarchy consisted of the high priest, a dozen chief priests, soothsayers, and virgins of the sun. These virgins were allowed to decide for themselves, after three years of education in the temple, whether or not they should dedicate their lives to the service of the Sun. The Incas believed in making visible offerings to deity and sacrificed animals of all kinds. The author thinks that human sacrifice was rarely if ever made. He neglects the evidence of Dr Uhle's discovery of sacrificed women at Pachacamac. This, together with the fact that at the time of the conquest there was a law prohibiting human sacrifice, would seem to prove that at an earlier date it must have been common.

The body of the Inca was embalmed, the palace of the deceased was set apart for the mummy, and it was endowed with lands so that offerings might be constantly provided. Three beautiful hymns to Uiracocha are given. The religious beliefs of the people were in harmony with the social system on which the government was based. We are sorry that the author does not tell us what he thinks of Uhle's belief that Uiracocha and Pachacamac were originally the same deity, that the worship of the latter on the coast dates from the time of the culture of Tiahuanacu, etc., etc.

Religious observances were dependent upon the calendar. The solstices and equinoxes were carefully observed by means of stone pillars. Five planets and many stars were named. The year was divided into twelve months of thirty days each with five added days at the end. One day was added each fourth year. The year began June 22, the winter solstice, with the harvest festival, and each month following had its special festival.

The Incas established one language throughout their dominions. This was not difficult because the separate dialects were but the debris of one original language spoken during the megalithic age. The accounts were kept by means of the *quipus* in the hands of trained officials, while pictures painted on boards preserved traditions, lists of kings, and historic events. Relief maps of clay were used by the Inca for

administrative purposes. Schools were established for the children of the royal families. Every lover of literature should read that most interesting relic of Inca learning, the drama "Ollantay," of which the author gives a new translation.

We formerly attributed to the Incas the origin and development of that splendid civilization found by the Spaniards, but the author brings out the fact that they only adapted their government to an ancient patriarchal system which was in vogue throughout the Andean region. The country, cut up by gorges and deserts, led to the formation of numerous separate communities, consisting of related families called *ayllus*. The land belonged to the ayllu and was assigned to heads of families. These ayllus united to form clans, tribes, and confederacies. The skill of the Incas consisted in systematizing these institutions and adapting them to the requirements of a great empire. This they did with an ability that has never been equalled.

The appendices include the List of Kings, Quichua and Aymara, Arts and Architecture, "Ollantay," and Folklore.

The term Aymara, as applied to the language spoken about Lake Titicaca is incorrect. The Aymara were a Quichua tribe, who were brought as colonists to the lake region where they learned the language of their new neighbors. The Jesuits came first to the Aymara and not knowing their history gave their name to the language.

A very complete list of Inca ruins is given but no description of architectural remains, as little can be added to Squier's accounts. For roads and bridges he refers the reader to Zarata, Leon, and Velasco, thus missing an opportunity to correct the exaggerated statements of some early chroniclers who have been copied by later historians and even by persons who have traveled in the country. If these great roads, running in every direction, thousands of miles of them, as we are told, were in the excellent condition reported, why did the Spanish soldiers have such difficulty with transportation and movements of troops and why did they complain so bitterly over the absence of trails? Why is there so little evidence of them today? For the most part they were merely wide, ungraded trails or parallel paths. The driven llamas were continually feeding as they went and did not confine themselves to a narrow road, except in the gorges where their own hoofs cut the grade. In a few places the roads were cut out of the rock and marshes were crossed by means of well-stoned roads, but one looks in vain for the beautiful macadamized highways of the historian's fancy.

The book is delightful, and will stimulate a new interest in this

most humane of the indigenous races of the New World. Let us hope that the author may yet give us the "detailed history" which he once had in mind to write.

WM. CURTIS FARABEE.

Notes Ethnographiques sur les peuples communément appelés Bakuba ainsi que sur les peuplades apparentées.—Les Bushongo. By E. TORDAY and J. A. JOYCE. (Annales du Musée du Congo Belge Publiées par le Ministère des Colonies. Ethnographie, Anthropologie.—Série III: Documents Ethnographiques, concernant les populations du Congo Belge, vol. II, part 1.) Brussels, February, 1911. 14½ × 10¾, pp. 1–291, plates I–XXIX, text figs., 1–403, map.

It is a matter of congratulation that we are beginning to obtain a better insight into the inner life of the tribes of Africa through thorough studies of various tribes. For a number of years this tendency has benefited particularly our knowledge of the material culture of the continent, but through recent works, such as Spieth's work on the Ewe, and Pechuël-Loesche's on the Loango, we begin to see the wealth of the mental life of the negro. The present work, conducted under the advice of Mr Joyce by the experienced explorer M. Torday with the assistance of Messrs M. W. Hilton-Simpson and Norman H. Hardy, is a contribution of first rank to our knowledge of African ethnology. Like all the publications of the Musée du Congo Belge, it is sumptuously printed and illustrated. Although the numerous half tones interspersed in the text perhaps do not quite reach the highest technical standard, they give an excellent idea of many sides of the life of the people. What they lack in detail is made up by the line engravings and the excellent plates that accompany the memoir.

It is difficult to say what part of the description of the authors is most interesting and important. The work opens with the legendary history of the people, the beginning of which is purely mythological, while later on historical elements seem to predominate. The comparative study of the history as recorded among various branches of the people leads the authors to the conclusion that the Bushongo migrated from the Shari into their present habitat between the Kasai and Sankuru. This conclusion is corroborated by a vocabulary of the Lumbila, a language which still exists in meagre rests and which, it is claimed, was spoken by the people until the middle of the eighteenth century (pp. 255 et seq.). According to Sir Harry Johnston this vocabulary shows certain affinities with a language spoken on the Shari (p. 43). Important is also the former occurrence of the throwing knife among these people (p. 36). While the combined arguments based on traditional history and on other

ethnographical data are very strong, we should hesitate to place quite as much reliance upon oral tradition as evidence of the earliest history of the people, as the authors do; and the assumption of a Berber origin of the reigning dynasty, based on the claim that their ancestor was of white color, does not seem well established on account of the frequent occurrence in all parts of the world of the idea of deities or ancestors of white color. Neither is the corroborative evidence of allied tribes quite to be relied upon, since reconstructed history is at least as likely to be accepted by neighboring tribes, as it is that an accurate history of very long periods should be correctly retained. The sources of inaccuracy must be still greater than those which are found in the recorded histories of the Sudan, which, for many years, had been kept as written records. For these reasons I should hesitate to accept the oldest chronological data and the whole sequence of 121 rulers as absolute historical truth, —as little as the endless genealogies of the Polynesians; and the history of the people before 1600 must certainly be considered as semi-mythological.

The political organization of the tribe presents phenomena of the greatest interest. The fundamental characteristics of African organization reappear here: the king and his numerous dignitaries, the female dignitaries, and the temporary transfer of power to a correlated administrative branch after the decease of the king (p. 63). Together with the descriptions of Pechuël-Loesche, Lias de Carvalho, and the over-systematized accounts by Dennett, they illustrate a most peculiar and complicated system of government, which is represented as far south as Natal, and as far north as the Niger region.

The description of initiation ceremonies is interesting, particularly the list of ethical precepts imparted in connection with it, the selection of which is determined by each ruling king. The police society with its friction drum is analogous to other African societies of this type. A recent origin is claimed for it (p. 87). The initiation ceremonies seem to lack in significance, a condition that has been often observed, but which must always be accepted with caution, because other facts may be kept secret by the informants.

Manifestations of social life, such as games, music, poetry are treated very briefly and are the least important sections of the work.

Marriage regulations, rules of descent, and taboos offer much that is of interest. Descent is in the maternal line, but group-taboos are primarily transmitted in the paternal line. These belong on the whole to villages. Tabooed animals may be killed, but not eaten. Although

this type of taboo is given a mythological origin, new taboos of the same type arise from time to time. It is claimed that in former times people who had the same taboo were exogamous. I should hardly accept the author's theory in so far as they see in these phenomena, "a degenerate totemism." A certain social community exists also among children born in the same month.

The observations on magic and divination contain much that corroborates the more recent descriptions of African fetishes.

The notes on agriculture, hunting, and fishing may be only mentioned here. The traditional history of the tribes in regard to the introduction of Indian corn and maniok is evidently based on facts. Among the devices for fishing a basket trap with release and floats, under which the fish assemble are perhaps worthy of special note. The description of the houses and villages is rather brief, but that of personal dress and adornment, cicatrization, and treatment of teeth is full and accompanied by many instructive illustrations. The various industries are adequately described, but the most important portion of this part of the book is the chapter on art with its wealth of illustration and of information regarding native names of designs. After a discussion of realistic motives, the authors describe the textile designs and their curious names. The observation that the designs are always named according to certain component elements, and the differences in naming that occur in the woman's art of weaving, and in the man's art of carving (p. 216 et seq., 227), although the men apply textile motives, are of great theoretical importance. A number of traditions and brief notes on the language are also given. In a final chapter are contained ethnographical notes on the Basongo Meno, a group of related tribes.

If in view of the excellence of this work a wish might be expressed, it would be that at least legends, poetry, proverbs, and related subjects had been given in the authentic form of original records, the importance of which does not seem to be recognized yet by all ethnologists.

FRANZ BOAS.

The Niger and the West Sudan: the West African's Note-Book. By A. J. N. TREMEARNE. London: Hodder and Stoughton (Arthur H. Wheeler and Co.), 1910. 8°, pp. 151.

Tremearne's book is intended as an assistance, a *vade mecum*, for the man going to British West African Colonies. It gives history, conditions, hints, advice upon a hundred points where detailed information is necessary. It is called a "notebook" because it is largely compiled from many

sources, in the very words of the original, and makes no pretence of being a literary production. One third of the book, that is fifty pages, is devoted to native peoples, who are considered under chapter headings—the Filani and others, the Hausas and others, the Yorubas and others. While these chapters have appeared as independent articles elsewhere they are here usefully presented together. Tremearne prefers the spelling Filani to the more common Fulah. In the ethnographic part of his work, as elsewhere, the matter is chiefly quotation. In each case, however, the author adds some personal comment in which he tries to make some deductions from the mass of conflicting statements. Chiefly interested in sources, he sees in the Filani a people where Berber and Negro have mixed; in the Hausas, a Semitic population from the region of Ethiopia or west from there, which has Hamitic and Negro infusion and which has moved westward; in the Yoruba, a population more distinctly Negro, but showing influences from north and east. It is not easy to grasp his views exactly.

FREDERICK STARR.

Nigerian Studies; or the Religious and Political System of the Yoruba. By R. E. DENNETT. London: Macmillan and Co., 1910. 8°, pp. xvii, 235.

This is Mr Dennett's fourth book on African peoples. Heretofore he has dealt with the Fjort, near the mouth of the Congo; this time he studies Nigerian populations. Everyone must appreciate the good-will and the industry of the author but his style is always confused to the degree that most students can gain only confused hints from reading him. This time he is dealing with populations which have already been described by others and his lines of treatment are more clear and decisive, and he makes many quotations which enable him to be better followed than usual. His proof too has been read by Mr Joyce, which has perhaps given the work more consistency and form than it would otherwise have. Even with these advantages, the confusion persists nor does Dennett's explanatory chapter completely explain it. Everyone realizes the difficulty of securing complete, consistent, and satisfactory information from natives—especially regarding social, governmental, and religious matters; and the vice of rounding out what one secures, by such filling as fancy, theory, or literary ideal demands, can not be too severely deprecated; but there is a middle course and fortunately our best field workers succeed in finding it. The man whose mind is clear and systematic can present things, even fragmentary and indefinite things, in comprehensible form.

In his introduction Mr Dennett emphasizes, what must strike everyone who reads his text and notes with care, the considerable number of native Africans who are now writing in regard to their own old life, customs, languages, and ideas. As this local literature is quite unknown to students generally, his remark is here quoted "Bishop Johnson gave us a little work on Yoruba paganism. . . . Bishop Phillips wrote a little book called *Ifa*. The Rev. Lijadu has given us *Ifa* and *Orunanila*. Mr Sobo wrote Arofa odes or poems. Dr Johnson has lectures on Yoruba history and Mr John O. George has written a short account of Yoruba history. Dr Henry Carr, . . . native of Egboland is an author of many interesting papers and keys to mathematical works. Mr Adesola is . . . writing . . . of Yoruba Death and Burial secret societies . . . in the Nigrian Chronicle. Mr Johnson is the editor of this paper . . . Mr Williams and Mr Jackson are editors of The Lagos Standard and The Lagos Record." Mr Dennett's book contains much of interest. Sacred stones are common in Nigeria and he calls attention to several. Some of them have distinctly phallic associations; others, while probably phallic, are believed to be transformed human beings, and, curiously, some of these are referred to persons who have undergone transformation within the memory of persons still living. Thus, Moruni and her son Alashe were turned into stones to which respect is paid, yet the houses in which they lived are still pointed out and Alashe's stone seat is now in the British Museum. Some interesting facts regarding the "bull-roarer" and its phallic associations are given; two quite different forms occur — both male, one older and one younger. *Oro*, who is represented by the bull-roarer, not only gives children but arrests disease and prevents death; while clearly phallic, the bull-roarer is not used in the male mysteries, as in Benin and Geduma, nor in initiation ceremonies. Dennett's information regarding times and days is interesting, as are his facts regarding divination by palm-nuts. He gives an extended discussion of the *Orishas* or divine beings, taking them in detail, one after another. Of course he comes to "categories" before he ends and finds six fundamentals, from which he develops an entire system of cosmogony, philosophy, sociology, and government. In the final working out of the system he finds identity between the Nigerians and the Fjort. Considering the complexity of the system this identity is a little distressing even when confined to Africa: here, however, as in his *Behind the Black Man's Mind*, Mr Dennett finds the system the same as that of Great Britain and identifies each item in the British social and governmental structure — even to the Archbishop of Canterbury and the House of

Lords. One can but wonder what Mr Dennett will do when Mr Lloyd George gets through with the House of Lords. No doubt a destructive tendency at work in Nigeria, will complete its work simultaneously with that in Britain.

FREDERICK STARR.

Collection de Monographies Ethnographiques. VI. Les Kuku. By JOSEPH VANDEN PLASS. 1910. 8°, pp. xlii, 407. *VII. Les Ababua.* By JOSEPH HALKIN, with collaboration of ERNEST VIAENE. 1911. 8°, pp. xv, 616. *VIII. Les Mandja.* By FERNAND GAUD, with collaboration of CYR. VAN OVERBERGH. 1911. 8°, pp. xxiv, 574. Bruxelles: Albert Dewit.

Three new numbers have recently appeared in the great collection of ethnographic monographs of African tribes being published under the direction of Cyr. van Overbergh. These deal with central African tribes and are due to three different authors. The exhibit at the Brussels Exposition of 1810, made in connection with these monographs was most interesting and instructive. In the Preface of the volume relating to the *Kuku*, Mr van Overbergh presents a detailed statement of the idea and plan of this exhibit. It consisted of two parts — documentary and display. The content of the former is concisely stated as follows: "More than 300,000 data regarding Negro Africa. These data transferred to separate cards, always classed in the same order, are comparable at all times in response to 202 questions, comprising all the social phenomena of the populations." These data have been brought together by a thorough search of printed sources and from answers oral and written to a series of inquests conducted both in Europe and Africa. It is from this enormous mass of documentary material that the volumes of the series so far printed have been constructed and from it the volumes to be written will be made. The classification is based upon the Questionnaire drawn up by Professor Joseph Halkin, of Liège, for the Belgian Society of Sociology. The labor involved in the mere accumulation of this material has been enormous but its value (and the labor) has been multiplied by its systematic classification. For it has been rigidly classified in four different fashions: (1) by authors, in alphabetical order; (2) by tribes, in alphabetical order of names; (3) by geographical regions; (4) by matter. This mass of documents, together with the Ethnographic Monographs so far issued, and dummies of the volumes ready for publication, formed the first part of this remarkable exhibit. The second part was a form of museum display containing some novel and suggestive features. It was but a section, taken from a proposed whole, to show possibilities. The thesis proposed was: "A modern museum ought to devote a part of

its halls to the temporary or permanent exposition of all social phenomena, in a manner to strikingly bring out the resemblances and differences of the most typical peoples." Seven social phenomena are recognized — the social, the economic, the genetic, the esthetic, the ideologic, the moral, the juridical, the political. As it was impossible at the Brussels Exposition to illustrate all of these phenomena, attention was focused upon a single phase of the ideological phenomenon — the religious. The Fang were selected as a single people for illustration and the notable collection brought together by Father Trilles, property of the Neuchatel Museum, was used in making the demonstration. The religious phenomenon among the Fang occupied a great alcove, objects and explanations covering three walls and filling floor cases. Two divisions were made of the material; (*a*) the religious phenomenon proper, (*b*) the religious life in its social phenomena. Under (*a*) were considered: (1) totem, (2) manes, (3) secret societies, (4) God; and each of the first three of these was exemplified in belief, worship, magic, priest (sorcerer, fetichman), future life. Similar analysis and procedure were applied to religion in its social phenomena. The careful selection, striking display, and instructive labeling and explanation of objects made a notable exhibit. The practicality and development possibility of the idea were made clear by the inscription accompanying a plan for "the palace of fetichism" drawn up by architect Horta. It reads: "If one should represent in a special museum — in the manner here employed for the Fang and for the religious phenomenon — each of the social phenomena; if one should do the same for the type populations of Africa, of Australia, of Asia, of America, in such a way that each phenomenon (documentation and objects) might be compared in its *ensemble* and in each of its subdivisions; one will have realized the Sociological, Colonial and Ethnographic Museum-type. If one confined himself to the representation of the religious phenomenon one would have the 'Museum of Fetichism' of which the accompanying plan was proposed for the Universal and International Exposition of Brussels (1910)." We have thought it worth while to call some attention to the plan here outlined by its author, Cyr. van Overbergh. The volume *Les Kuku* deals with a little-known population living in the Lado Enclave, for a time under the control of the Congo Free State, now a part of the Anglo-Egyptian possessions. So little has ever been said by anyone else of the Kuku, that the volume is practically a new work by Joseph Vanden Plass, long in the employ of the Congo Free State and Congo Belge. It is a clear and straightforward presentation of the more evident facts of daily life and government but is weak in the

important matters of native thought, as exemplified in kinship, magic, belief, and religion. The Kuku live in a rolling country of grass and small trees; they have little knowledge of rivers or considerable water-bodies; they are agriculturists and much interested in cattle. Men go naked—a rather unusual practice among Congolese tribes; rather interesting are the facts regarding "the chief of water."

In volume seven of the series, *Les Ababua*, by Professor Halkin, of the University of Liège, with the collaboration of Col. Ernest Viaene, we have an expansion of a book published several years ago by Professor Halkin under the same title. Our readers will remember that the whole undertaking of these Ethnographic Monographs grew out of the Mondial Congress held at Mons, Belgium, in 1905. There the scheme of an International Ethnographic Bibliography was launched. Halkin himself has been the chief worker in the preparation of the mass of 300,000 data already mentioned; he was the author of the 202 questions, which have served to classify these data; it is he who has recently prepared a *Cours d'Ethnographie et Geographie ethnographique* for the use of African observers. His original *Les Ababua* was tentative. The new work is a great increase upon the old one; that contained a half-page bibliography, this has 10 pages; that had no iconography, this gives 11 pages to a list of iconographic material; that has 170 pages of text, this has *apparently* 600. The material in the new volume is chiefly compilation, but there is interesting new matter. The best source drawn upon is de Calonne, who knew what was most important. Ababua is a general term applied to a group of kindred tribes, living north of Stanley Falls, in the valleys of the Uele, Itimbiri and Aruwimi rivers, in the administrative District Uele. They are usually known as "the terrible Ababua," "the fierce Ababua." They are hardly entitled to the designation, which they probably owe to the Azandeh, who were interested in maintaining the fiction. De Calonne supplies considerable interesting matter relative to totems, magical ideas, and stories. His *Mba* stories are only part of a large series, still mostly unknown. Mba is the cunning hero, who is always being fooled. Linguistic matter is introduced into all three of the volumes before us. All of it appears to be new and hitherto unpublished.

In the volume *Les Mandja*, the series go for the first time outside the Belgian area; for the Mandja live in Congo Français. The author, Fernand Gaud, is a French colonial author. Only a few thousand Mandja remain but those cling persistently to their soil, although islets of Banda have found lodgment among them. Their country lies somewhat to the west of the Ababua, on the Ubangi River, about where it

turns abruptly to the south. They appear to differ notably from other tribes of the region. Thus, we are distinctly told that they have no markets, no objects buried with the dead, no slaves, no palavers, no clubhouse, no council. Our author, repeatedly too, insists upon the incapacity of the people in thought, language, and expression. We can but doubt some of these negatives and limitations. The Mandja make fire by friction of wood by the plowing method; they wear labrets; they have the interesting "silent exchange," which is described in detail. Gaud has had a special scientific training — he is a chemist — and, while we feel doubtful of his gaps, we have to thank him for some specially careful, exact, and novel observations. His detailed description of the narrowing of the slit in the great wooden gong-drum is fine; his description of native salt-making the best we know; his list of cultivated plants, arranged according to use, runs to thirty species; his calculation of the actual labor necessary to produce a harvest is interesting in itself and of practical significance in the direction of the limits to place upon labor demands in corvee and rubber-gathering; his calculations of nutrition and of muscular force are valuable and original.

FREDERICK STARR.

SOME NEW PUBLICATIONS

AMEGHINO, FLORENTINO. La antigüedad del hombre en la República Argentina. Buenos Aires: 1911. 6½×10¼, 52 pp.

AMERICAN ANTIQUARIAN SOCIETY. Manuscript records of the French and Indian war in the library of the Society. Prepared from the originals under direction of the Library Committee by Charles Henry Lincoln. (Trans. and Coll. Amer. Antiq. Soc., vol. XI.) Worcester, Mass., 1909. 6¼×9¾, 267 pp.

BLEEK, W. H. I., *and* LLOYD, L. C. Specimens of Bushman folklore. With an introduction by George McCall Theal. London: George Allen & Co., Ltd., 1911. 5½×8½, xl, 468 pp., 50 ills.

BOAS, FRANZ. The Mind of Primitive Man. New York: The Macmillan Co., 1911. 12°, pp. 304. (Price $1.50 net.)

BRIGHAM, WM. T. Ka hana kapa. The making of bark-cloth in Hawaii. (Memoirs Bernice Pauahi Bishop Museum, Vol. III.) Honolulu: Bishop Museum Press, 1911. 10×13, 273, iii pp., 48 pls., 131 figs.

BRUNHES, JEAN. La géographie humaine. Paris: Félix Alcan, 1910. 6½×10. iv, 843 pp., 206 ills.

BUREAU OF AMERICAN ETHNOLOGY. Twenty-seventh annual report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution. 1905–1906. Washington: Government Printing Office, 1911. 7½×11¼, 672 pp., 65 pl., 132 figs.

In addition to the administrative report of the Chief of the Bureau, the volume contains (pp. 17–672) a memoir on the Omaha Tribe by Alice C. Fletcher and Francis La Flesche.

CAMPBELL, REV. F. J. Pioneer priests of North America, 1642–1710. Vol. III—Among the Algonquins. New York: The America Press, 1911. 6¼×9. xxii, 312 pp., ills.

FLETCHER, ALICE C., *and* LA FLESCHE, FRANCIS. *See* BUREAU OF AMERICAN ETHNOLOGY.

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ANTHROPOLOGIC MISCELLANEA

The Stone Collars and Three-pointed Stones of the West Indies.—The object of this brief note is to present what I believe to be the true explanation of the stone collars and three-pointed idols found in Porto Rico and Haiti.

Apart from precise declarations as to the character of these objects, the deductions as to their ceremonial and other uses are based on analogies in comparative ethnology, are in no sense exhaustive, and are advanced with proper reserve on the evidence of the stones themselves. The writer has examined with care the splendid collection in the National Museum at Washington, the largest and most complete in the world, and has used information gathered during many visits and a somewhat protracted residence in Cuba during the last twelve years.

The pre-Columbian population of the Antilles was, in Cuba, Haiti, and Porto Rico, Tainan-Arawak, closely related to the existing Arawak tribes of the Guianas in South America. They were being exterminated by the fierce Carib who, sweeping up through the Lesser Antilles, had at the time of the first voyage of Columbus established a foothold on Porto Rico and controlled perhaps a fifth part of Haiti. Had the Spanish conquerors not arrived, another century of Carib advance would have been equally disastrous to the peaceful Arawak.

I am much indebted to Dr Jesse Walter Fewkes, of the Bureau of American Ethnology of the Smithsonian Institution, and to his excellent report on the "Aborigines of Porto Rico," to which I shall make constant reference. Dr Fewkes writes (page 167 supra):

> "The theories which have been advanced in explanation of the use of the Porto Rican stone rings are almost as numerous as the writers on the subject, but unfortunately not one of the theorists has carried his hypothesis far beyond a simple suggestion."

Dr Fewkes' conclusions were that no theory thus far advanced possessed more than the merit of plausibility

Basing this study of the stone rings on Dr Fewkes' type-form (our figure 58) and the slender ring represented in plate LXVIIc (our figure 59) and described on page 165, I state unhesitatingly that the slender ovate rings represent the female sex-organ expanded as at the moment of parturition. The boss or swelling at the top is the mons veneris. The

decorated panel is the uterus with the vagina and vagina orifice at the base. The undecorated panel shows the bladder with the urethra depending, and at its base the urethra orifice. The band across the urethra represents the urethral sphincter.

Referring now to plate LXVII panels of slender ovate collars (rings), Latimer collection, figure *a* shows an extremely conventionalized fetal ovum. Figure *b* exhibits a conventionalized uterus in detail with ovaries, fallopian tubes os uterus and an exaggerated fetal ovum in the center, all etched in outline. Figure *c* shows a conventionalized double fetus with characteristic curvatures. The carving on the ridge is an even more graphic representation of a developed fetus

FIG. 58.—Type-form of stone ring. (After Fewkes.)

These characteristics appear with marked regularity on all slender rings. I am disposed with some reserve to regard all massive rings as unfinished specimens, in process of development to the slender ovate type. Inasmuch as each highly finished ring represented a great amount of labor, it is reasonable to hold that there should appear a proportion of uncompleted specimens. Examination of the "elbow stones" convinces me that they are the panels of rings, broken perhaps in the process of manufacture and then finished as fragments. Several of these show the uterine markings. I have failed thus far to discover a significance in the right and left character visible in the slender rings.

I wish here to interpose the view that these rings involved two processes of manufacture certainly, and possibly three: first a process of spalling by the application of a quick and intense heat to localized sections of the stone to be carved, followed by application of water. By this means the stone was rapidly reduced in the rough to approximately the dimensions and shape desired. Following this treatment came a pecking with harder stone than the object and it is well to call attention to the fact that in both Haiti and Cuba were to be found

quantities of meteoric and magnetic iron. While the Arawak are not known to have possessed any knowledge of iron-working as they had in a limited way of gold-working, they had ample opportunity to utilize the superior hardness of native iron whether with an edge or not. I have seen several specimens of stone work which showed that a herring-bone pattern was pecked into the stone and then the intervening ridges broken down as a part of the process of reduction. The final process was one of smoothing and polishing by grinding. In this direction the Arawak had arrived at a high degree of expertness. As bearing on the use of heat for spalling, it is certain that the Arawak made and used charcoal, not only for culinary purposes, but for burning pottery. They also knew and had access to asphaltum, and pitch and other inflammable gums. I have reason to believe that they knew how to use a primitive blowpipe and could produce a blue flame to aid in boring holes in stones. Furthermore, they had most naturally discovered the effect of fire on lime carbonate rock, and I have seen places where it seems evident that they had used mortar and a crude cement. The Arawak were not especially gifted with prevision and invention, but the exceptional individual possessed those mental qualities, as among all peoples, and therein lay the secret of tribal advance toward a higher cultural state.

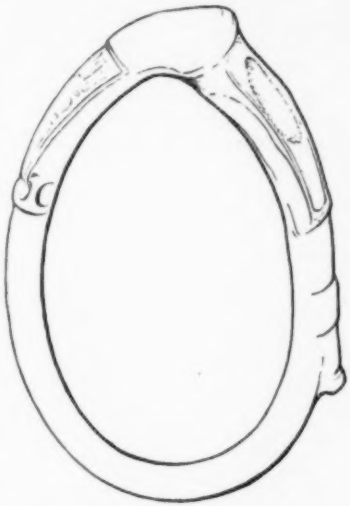


FIG. 59.—Schematic drawing of a slender, oblique stone collar.

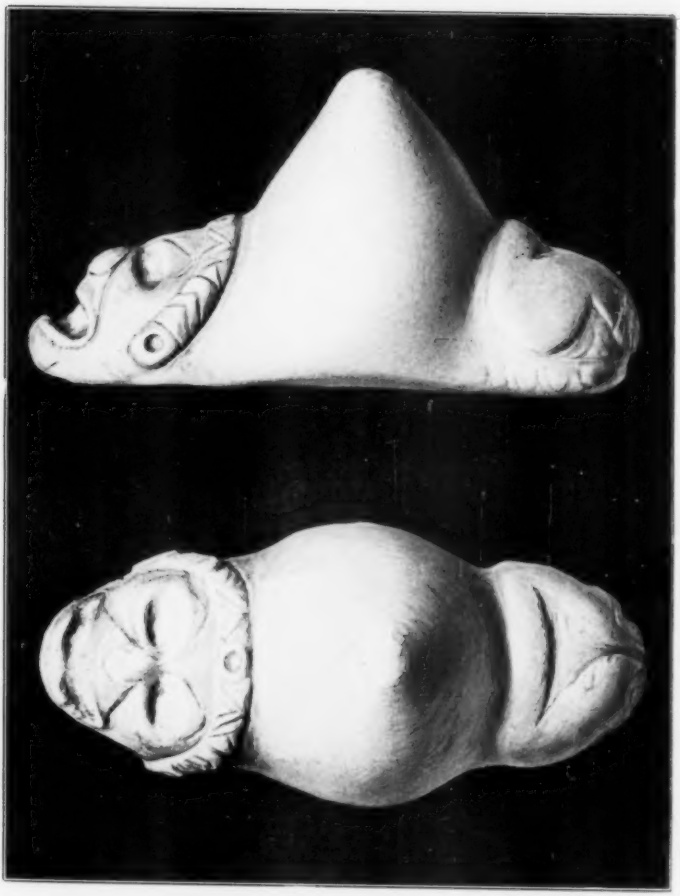
The three-pointed idols, for present discussion and for convenience, I have divided into two classes, of which plate XL of Dr Fewkes' work (pl. XXIX herein) is a good example of one and plate XLV contains examples of the second. Plate XL typifies the protuberant abdomen of the pregnant female, with at one end a head presentation of the child. Many of these three-pointed stones show at one end the head presentation and at the other the breech presentation. Sometimes there is

the representation of a bird or animal head at one point. This is, perhaps, an indication of the clan or family.

I will now suggest the uses of these objects, with, as stated in the beginning due reservation:

First we have ample evidence of the exogamous character of the Tainan-Arawak marriage customs, with emphasis on the preponderant strength of the female ties. Frazer dwells sufficiently on this in his work on totems, and refers at some length to Hilhouse, British Surveyor of Demerara, who married an Arawak woman and who wrote with personal knowledge of their clans and customs. It is a reasonable assumption that this emphasis on the female line should have had a marked bearing on the development of a cult, religious and ceremonial, in which female phallicism played a conspicuous part. Sexual function and anatomy are almost invariably understood by all primitive peoples. I suggest that these stone rings had not only a part in the ceremonial invocation of fertility of soi and race mentioned by the Spanish writers but several practical uses. They were probably exhibited to the pregnant woman about to be confined to develop by auto-suggestion the thought of an easy delivery, but may have been used as an aid to delivery in a crude form of obstetrics, by being placed over the abdomen of the woman in the pangs of childbirth. Similar uses have been ascribed to the stone yokes found in Mexico, by Professor W J McGee, and I have been told by army officers that they have seen Indian women aided in delivery by the use of heavy cinctures tightly drawn across the abdomen.

A very recent book *La Obstetricia en Mexico*, by the well-known Mexican gynecologist, Dr Nicolas León, gives much interesting material of customs among the cognate pre-Columbian peoples of that country. He shows the yoke placed across the abdomen and its use as a "silla para al parto," that is a delivery chair. From the shape and character of the stone rings both slender and massive, they may well have been used for this identical purpose by the Arawak shamans. A crouching posture in delivery, clinging with the hands to an overhead support, was a usual one with primitive people. Many of the Mayan sculptures and pictures show this position. The Mayan literature furthermore shows long and complicated religious ceremonials attending every stage of pregnancy. Peter Martyr asserts that in 1518 a settlement was visited on the coast of Yucatan where the same language was spoken as in Cuba. It is recorded that Columbus met on the south coast of Cuba large trading canoes laden with the rich products of Yucatan, and Spanish writers claimed that there was commerce between the two countries.



LATERAL AND TOP VIEWS OF A WEST INDIAN THREE-POINTED STONE 5⅛ × 2½ INCHES. (After Fewkes.)

At this distance from a people who have disappeared as a nation, there can be only speculation as to ceremonial usages The ceremonies probably varied from generation to generation, from island to island, even from one petty cacique to another, and I doubt if the Arawak had been sufficiently long in any of the principal Antilles to have developed the high ceremonial which follows after many generations of fixed residence. But I wish to call attention to a quotation from Landa, given by Dr León, to the effect that the Maya placed at the foot of the bed of a woman in childbirth the idol of a female demon, "que dazian era la diosa de hacer las criaturas."

In line with the collateral testimony given above I suggest that the first type of three-pointed stones was exhibited to the married woman to suggest fertility, and that a ceremonial development of this idea may be predicated.

The second type of three-pointed stone was perhaps exhibited to the betrothed maiden, and had a prominent place in the marriage ceremony, of which the rupture of the hymen was a feature. There is ample authority for asserting that many persons had access by privilege of the first night and it is to be presumed that the bride had to be prepared in advance for the ordeal. The curved bases of both types of three-pointed stones suggest their use ceremonially and practically, in connection with the collars, by being placed on the abdomen of pregnant women.

In respect to the use of the blowpipe I have seen Mosquito Coast Indians use the long hollow bones of the *rabihorcador*, or frigate bird, with a burned clay tip as a blowpipe for soldering, and they have Carib and probably some Arawak blood. The Arawak compressed the heads of their infants exactly as did the Maya and had many of the same habits, customs, and characteristics.

I will conclude with a quotation from León's *Obstetricia en Mexico*, page 49.

"Todas las tribus indias del México precolombino tenían en alta estima el poder fecundante de la naturaleza, manifestado en un modo tan especial en la procreación humana, y la deificaban en los órganos mismos de ella. Por eso es que encontramos tantas imágenes fálicas en sus antigüedades, y en estatuaria, ya en pictógrafos, siendo notable entre estos una de las láminas del 'Codex Borbónicus' y también en retrato del sabio rey de Texcoco Netzahualcoyotl que ostenta por divisa, en su escudo guerrero, el geroglífico de la vulva femenina, no para indicar su amór á la incontinencia, como algun moderno escritor lo ha dicho, sino para sinbolizer su veneración á la generación humana."

HERBERT JANVRIN BROWNE.

Mr Bushnell's Review of "The Stone Age." — In the January–March *Anthropologist*, vol. 13, no 1, on page 153, appears a review of my recent work, *The Stone Age in North America*. I have never published a reply to any criticism of my works. In fact, I always welcome criticism; but this review by Mr Bushnell is so unfair and exhibits such ignorance of stone age times in America that I crave permission to reply at some length.

If Mr Bushnell had read *The Stone Age* he would have observed that the classification made use of by me is the one adopted by the American Anthropological Association at the Baltimore meeting, 1908; that this classification was not complete but a skeleton classification; that classifications of such objects as were not considered by the committee were made by me in addition, but it was explicitly stated by me that several of these were not entirely satisfactory,—as an example, the classification of bone implements, page 134, vol. II.

The classification of pipes is that by Mr J. D. McGuire, and not my own at all, and copper objects are classified by Mr C. E. Brown. Mr Bushnell's statement that the classifications are according to my own conceptions is not correct and his further statement that the work is valueless is an affront to the committee which drew up the original classification, as wel as to all the distinguished archeologists and ethnologists who either wrote papers for *The Stone Age* or permitted lengthy quotations from their publications.

It was stated in the preface, vol. I, page v, that the work is incomplete; and on page 357, vol. II, that the work is pioneer in its character. There are in a score of places throughout the two volumes references to the fact that future archeologists will expand or change many of my observations, etc. Mr Bushnell completely ignores all of these references, and he quotes my statement to the effect that men who study modern material have not a clear perspective of the past — that is of pre-Columbian conditions. He says that this is a key to the whole work. He implies that I am in error. The statement is true, and I stand back of it. It is because the bulk of implements and works in this country are not known to existing tribes, or were not known to the tribes of the past two centuries that it becomes necessary for such studies as are set forth in *The Stone Age*. For instance, the earthworks of the Ohio valley can not be explained by a study of any historic tribes of which we have knowledge. While one may find references in the accounts of Spanish historians to mounds, yet the geometric earthworks so common in the Middle West must be solved through archeology, for history will not aid us. Neither can the remarkable objects and altars found in the Scioto

valley, Ohio, be explained through the study of historic tribes. The arrow, the spear, the hatchet, the pot, and many other things have been in use in historic times and I not only stated so in my book but quoted numerous authors to that end. All of this Mr Bushnell has overlooked

Mr Bushnell takes satisfaction in pointing out that the Chippewa Indians still use bone celts. I spent seventeen weeks on White Earth reservation, Minnesota, and made a list of all the full blood Chippewa Indians on that reservation for the Interior Department. Our party had engaged the oldest full blood Indians as witnesses. Our interpreters were competent. We came in contact with more Indians than we would have done had we been engaged in ethnological work; yet we did not find a single bone or stone tool in use among these Indians, although diligent inquiry was made, and there are 5,300 Chippewa on or about that reserve. There may be a few Chippewa in Canada who use bone hide-scrapers, but that has no more relation to my argument than the fact that Major Powell or Lewis and Clark saw bone scrapers, or bone gouges, or any other kinds of bones or flints in use among historic Indians.

Mr Bushnell states that my chapter on "the population in prehistoric times" contains contradictory and ambiguous statements. I was very careful to indicate in that chapter the difference between historic and prehistoric sites. If Mr Bushnell will take pains to study the prehistoric sites in the Tennessee, Cumberland, Scioto, Susquehanna or other river valleys and compare these with the known Cherokee, Shawnee, or other historic sites he will observe the great quantity of material found on one and the absence of it on the other The population in prehistoric times can not be measured by our knowledge of the population in historic times. We must decide the question through a study of surface conditions.

Regarding the stone age in historic times, Mr Bushnell states that ". . . the author disposes of the subject by quoting a few paragraphs from a work on the Seri Indians living on an island in the gulf of California!" Why the exclamation? That implies a mistake on my part. Does Mr Bushnell object to quotations from Professor McGee's comprehensive work? Or, does he mean that the Seri Indians do not live on an island in the gulf of California?

Harvard University has just published the results of more than twenty years exploration on the part of Mr Ernest Volk in the Delaware valley. It is one of the most important publications dealing with that mooted subject, "man of the glacial period" I referred to Mr Volk as a real archeologist, and he is such. Mr Bushnell places quotation marks

around the words "real archeologists," thus casting a slight on the long and honest labors of a most worthy man. Mr Volk has for twenty years faithfully and conscientiously explored one site until he not only knows that site but is able to speak with authority concerning it. I can find no researches of Mr Bushnell's that will compare in importance with the work done by Mr Volk.

The last paragraph of Mr Bushnell's review states that the text seems to have been prepared to suit the illustrations. This statement is not only unjust but untrue. A number of persons, knowing that I was publishing *The Stone Age* at a financial loss, made illustrations for me, and some figures were selected from the Government's and Mr Moore's reports, and two or three other sources. Many museum reports are made possible through the generosity of patrons. It is considered entirely proper for persons of means to aid authors or institutions in such manner. In view of such a prevalent custom, the singling of my work out for attack on this score is quite remarkable.

In a pioneer work it is natural that some errors will creep in. Particularly is this true of a work which departs from the established order of things and does not attempt to explain the wonderful art of the past by a study of the degenerate art of the present. There are some statements in *The Stone Age* which may be changed by future archeologists. There are also many observations which the school Mr Bushnell represents will regard askance, because that school sees nothing beyond the culture of historic Indians in America. I feel confident that for the most part the statements and observations offered in *The Stone Age* will stand, for the very good reason that they are based on a study of implements and types. *The Stone Age* is the result of twenty-five years study of the kind of artifacts illustrated in its pages. I am quite willing to leave the fate of the work in the hands of future archeologists, who will regard these various cultures in their true light. If Mr Bushnell would take the trouble to examine prehistoric sites and collections, he might realize the fact that there is a difference between past and present arts among our aborigines.

WARREN K. MOOREHEAD.

Anthropological Work under the Canadian Government.—On the opposite page is a view of the Victoria Memorial Museum, the national museum of Canada and headquarters of the anthropological work recently entered upon so vigorously by the Canadian Government in connection with its Geological Survey. During last summer the Anthro-

pological Division prosecuted several lines of field work. Dr Cyrus MacMillan of McGill University made a prolonged and careful study

The Victoria Memorial Museum, the national museum of Canada, Ottawa.

of the Micmac Indians of Nova Scotia, Cape Breton Island, and Prince Edward Island. The material obtained consists largely of

folk lore, but attention was also paid to many other aspects of Micmac ethnology, including their religion, social organization, and manufactures. Mr W. H. Mechling has been making a similar study of the Malecite Indians in New Brunswick and Quebec, some attention being also paid to music and language. Dr A. A. Goldenweiser of Columbia University has made a particularly intensive study of the social organization of the Iroquois Indians of Grand River Reserve, special attention being paid to the clan system, naming, and related topics. This is intended to be but the first step of a thorough study of Iroquois culture under the auspices of the Survey. Mr C. M. Barbeau continued his Huron-Wyandot researches in the neighborhood of Amherstburg, Ontario, and obtained much new material of value. He is now following up this work among the Wyandot of Quapaw Agency, Oklahoma. Dr Edward Sapir spent about a month in a rapid reconnaissance of several eastern Canadian reserves, including Grand River, Caughnawaga, Pierreville, Cacouna, and Pointe Bleue on Lac St. Jean, the main objects of the trip being to procure new material for the museum and to get a preliminary insight into various Iroquois and Algonkin dialects. Museum material has also been secured in connection with the other field trips referred to. As the ethnology of eastern Canada has been comparatively neglected by students, the Survey is making a special point of rescuing what is still to be learned from the Indian tribes of eastern Ontario, Quebec, and the Maritime Provinces.

The Museum of Anthropology of the University of California, comprising the great Hearst collections in archeology and ethnology, was opened for public exhibition October 4, 1911, in its temporary quarters at the Affiliated Colleges in San Francisco, with a reception tendered by Mrs Phoebe A. Hearst and the regents of the University of 400 guests.

During the past year Mrs Hearst provided for placing the greater portion of the collections under glass, to assure their protection and make possible their public exhibition. The museum is now open to visitors daily throughout the year, excepting Mondays, but including all Sundays and holidays, from 10 A. M. to 4 P. M. The exhibits displayed consist of: Ethnology of the California Indians; Archeology of Peru; Archeology of Greece and Italy; Archeology of Egypt; and a Revolving Exhibit. This last is changed periodically at intervals of about two months, a new unit collection illustrating some definite point in the history of man, or showing some new accession, being installed each time. In addition, exhibits of the ethnology of the Indians of the North Pacific Coast, and of the Southwest, are in course of preparation.

A part of the Peruvian and Egyptian collections, all the abundant series of specimens illustrating the archeology of California, and the material from the Plains Indians, the Pacific Islanders, the Philippines, and other regions, must remain, for the present at least, in storage, awaiting either the larger, permanent building that will ultimately be the home of the collections, or a more extensive equipment than is now available.

Mrs Hearst's gifts to the museum and the researches carried on in connection with its work have approximated a million dollars, making the largest single contribution to the furtherance of anthropology ever made in America and perhaps in the world. The present value of the collections may be estimated to be several times their original cost. A number of other patrons who have supplemented Mrs Hearst's efforts have helped to round out the collections and bring them up to a total of 70,000 well coordinated specimens.

Mr F. W. Hodge, Ethnologist-in-charge of the Bureau of American Ethnology of the Smithsonian Institution, returned to Washington in October from an expedition to New Mexico, conducted under the joint auspices of the Bureau and the School of American Archæology at Santa Fé. Early in September Mr Hodge proceeded to El Morro, or Inscription Rock, in western New Mexico, where, with the assistance of Mr Jesse L. Nusbaum, of the School of American Archæology, paper impressions and photographs of the inscriptions on the rock were made. Mr Hodge later joined Dr Edgar L. Hewett, Director of the School of American Archæology, on an expedition to the Jemez Valley, about sixty-five miles northwest of Albuquerque, where excavations were conducted in the ruins of a large stone pueblo known as Amoxiumqua, which measures about 1,100 feet by 600 feet, and is situated on a mesa rising 1,800 feet above Jemez River. The results of these excavations were very productive and substantiate certain definite traditional and historical testimony respecting the former occupancy of this village by the Jemez tribe.

The 455th regular meeting of the Anthropological Society of Washington was held in the new National Museum building, on Tuesday afternoon, October 24, 1911. The following program was presented: "Exhibition and Description of Some Impressions of Spanish Inscriptions of the Seventeenth and Eighteenth Centuries, in New Mexico," by Mr F. W. Hodge; "Indian Survivals in the Carolinas," by Mr James Mooney; and "Some Archeological Problems of the Winnebago Indians," by Dr Paul Radin. At the 456th regular meeting, November 14, 1911, Dr W J McGee made an address on "Conditions Limiting Growth of Population in the United States."

DR HUTTON WEBSTER Professor of Social Anthropology in the University of Nebraska, was the delegate of the American Association for the Advancement of Science to the First Universal Races Congress, held in London, July, 1911. At the Portsmouth meeting of the British Association for the Advancement of Science, Professor Webster read a paper on "The Origin of Rest Days," and a second paper on "The Relations between Totemic Classes and Secret Societies."

MR HARLAN I. SMITH delivered the first of the season's course of lectures of the Montreal Branch of the Archæological Institute of America, on Oct. 11, 1911, in the Chemistry Building of McGill University, Montreal, Canada. The subject of his lecture, which was illustrated with lantern slides, was "The Archæology of Western Canada."

WITH the beginning of the year 1912, *The Journal of Religious Psychology and Education*, published at Clark University, will become the *Journal of Religious Psychology, Including its Anthropological and Sociological Aspects*, under the editorship of President G. Stanley Hall and Professor Alexander F. Chamberlain.

IN response to the appeal to raise the sum of £15,000 as a building fund for the Galton Laboratory for National Eugenics at the University of London, sums amounting to a total of £2,260 have been given, promised, or promised conditionally on the buildings being begun within two years.

ON November 10, 1911, Mr Harlan I. Smith of the Victoria Memorial Museum, of Ottawa, Canada, gave the first in a series of free lectures initiated by him, his subject being "The Educational Work of a Great Museum."

THE fellowship of the International School of American Archeology and Ethnology at Mexico City, has been awarded by Harvard University to George Plummer Howe, A.B. 1900, M.D. 1910, of Lawrence, Mass.

THE annual Huxley memorial lecture of the Royal Anthropological Institute was delivered on November 23 by Professer F. von Luschan, whose address was on "The Early Inhabitants of Western Asia."

PROFESSOR FLORENTINO AMEGHINO, the well-known paleontologist and director of the Museo Nacional in Buenos Aires, died on August 6 at La Plata, at the age of fifty-six years.

DR ALEXANDER F. CHAMBERLAIN, hitherto Assistant Professor at Clark University, Worcester, Mass., has been appointed full Professor of Anthropology in that institution.